

JPRS 71869

14 September 1978

20000414 106

USSR AND EASTERN EUROPE SCIENTIFIC ABSTRACTS  
BIOMEDICAL AND BEHAVIORAL SCIENCES  
No. 94

U S S R

EAST  
EUROPE

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<b>BIBLIOGRAPHIC DATA SHEET</b>	1. Report No. JPRS 71869	2.	3. Recipient's Accession No.																
4. Title and Subtitle USSR AND EASTERN EUROPE SCIENTIFIC ABSTRACTS - BIOMEDICAL AND BEHAVIORAL SCIENCES, No. 94		5. Report Date 14 September 1978																	
7. Author(s)		6.																	
9. Performing Organization Name and Address Joint Publications Research Service 1000 North Glebe Road Arlington, Virginia 22201		8. Performing Organization Rept. No.																	
		10. Project/Task/Work Unit No.																	
		11. Contract/Grant No.																	
12. Sponsoring Organization Name and Address		13. Type of Report & Period Covered																	
		14.																	
15. Supplementary Notes																			
16. Abstracts  The report contains abstracts and news items on aerospace medicine, agrotechnology, bionics and bioacoustics, biochemistry, biophysics, environmental and ecological problems, food technology, microbiology, epidemiology and immunology, marine biology, military medicine, physiology, public health, toxicology, radiobiology, veterinary medicine, behavioral science, human engineering, psychology, psychiatry and related fields.																			
17. Key Words and Document Analysis. 17a. Descriptors  <table border="0"> <tr> <td>USSR</td> <td>Medicine</td> </tr> <tr> <td>Aerospace Medicine</td> <td>Microbiology</td> </tr> <tr> <td>Agrotechnology</td> <td>Physiology</td> </tr> <tr> <td>Biology</td> <td>Psychology/Psychiatry</td> </tr> <tr> <td>Botany</td> <td>Public Health</td> </tr> <tr> <td>Epidemiology/Immunology</td> <td>Radiobiology</td> </tr> <tr> <td>Human Engineering</td> <td>Toxicology</td> </tr> <tr> <td>Marine Biology</td> <td>Veterinary Medicine</td> </tr> </table>				USSR	Medicine	Aerospace Medicine	Microbiology	Agrotechnology	Physiology	Biology	Psychology/Psychiatry	Botany	Public Health	Epidemiology/Immunology	Radiobiology	Human Engineering	Toxicology	Marine Biology	Veterinary Medicine
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Botany	Public Health																		
Epidemiology/Immunology	Radiobiology																		
Human Engineering	Toxicology																		
Marine Biology	Veterinary Medicine																		
17b. Identifiers/Open-Ended Terms																			
17c. COSATI Field/Group 2, 5E, 5J, 6, 8A																			
18. Availability Statement Unlimited Availability Sold by NTIS Springfield, Virginia 22151		19. Security Class (This Report) UNCLASSIFIED	21. No. of Pages 65																
		20. Security Class (This Page) UNCLASSIFIED	22. Price PCAD 4																

14 September 1978

# USSR AND EASTERN EUROPE SCIENTIFIC ABSTRACTS

## BIOMEDICAL AND BEHAVIORAL SCIENCES

No. 94

This serial publication contains abstracts of articles and news items from USSR and Eastern Europe scientific and technical journals on the specific subjects reflected in the table of contents.

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USSR

UDC 577.3

RESPIRATORY ACTIVITY OF MITOCHONDRIA IN ROOT CELLS OF CORN GROWN UNDER  
CONDITIONS OF ALTERED GRAVITY

Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 241 No 1 1978 pp 238-241  
manuscript received 31 Mar 78

TAIRBEKOV, M. G., MAILYAN, E. S. and ROZOV, A. N., Institute of Medical  
Biological Problems, Moscow

[Abstract] Seeds of corn, Sterling sort, were subjected to i) rotation, in a drum clinostat, in a vertical plane continuously, at 10 rotations/min, for 72 hrs, or to ii) centrifugation, 87 rev/min, continuously for 72 hrs, corresponding to an acceleration of 2 g.; room temperature for each, and for the control, was 25°. The seeds were then grown by an earlier described method (Sarkissian, 1968). Respiratory activity of the mitochondria was then measured polarographically. Respiratory rate in the controls exceeded that in the seeds subjected to clinostat and centrifuge conditions, but the differences in the two latter experimental plants were not significant. Substrate oxidation in all three plants, control and experimental, did not differ significantly. It is suggested that the altered conditions of gravity --though they affect the energy processes of the mitochondria--only prolong the initial reversible stages of those processes and do not leave structural traces in the organelles; further, that weightlessness is not a prerequisite for a normal realization of basic biological processes. Figure 1; references 7: 2 Russian, 5 Western.

HUNGARY

INCREASED EFFICIENCY IN CATTLE FEEDING THROUGH THE USE OF MODERN METHODS

Budapest ALLATTENYESZTES in Hungarian Vol 27 No 2, 1978 pp 105-122

BEDO, Sandor, Chinoin Pharmaceuticals and Chemical Products Factory,  
Budapest

[Abstract] The following subjects are discussed: (1) Reduction of the nutrient loss in feed plants after harvesting (improved drying methods, coverage of the silage with foil, improved harvesting methods, better utilization of the byproducts); (2) calf breeding (better control of the intestinal bacterium flora, optimization of feeding, feed modification for the lactating cow, provision of better drinkingwater supply); (3) modern methods of beef production (better methods of feeding, maximization of the weight gain, feed additives); (4) feeding of milk-producing cows (elimination of time-honored methods which were found to be unsuitable on the basis of modern research, genetic improvements for increased milk yield, veterinary supervision of milk-producing cows); (5) scientific compounding of the feed for beef cattle; (6) coordination of biological and economic considerations (combined feed methods, coordination of feed-plant harvest and diet, availability of reserve feed); and research toward improved methods of cattle feeding with all its ramifications. These are all very important projects since studies indicate that the feeding costs represent 60 to 80 percent of all cattle rearing expenditures, and since cattle rearing accounts for a major portion of the total agricultural production. The trend is toward increasing the protein content of the feed. Figures 4; reference 1, Hungarian.

USSR

THREE HARVESTS PER YEAR

Kishinev SEL'SKOYE KHOZYAYSTVO MOLDAVII in Russian No 4, Apr 78 pp 45-46

LEGKUN, B., chief of the department of field crop cultivation and fodder production of the Kagul Water-Conservation Sovkhoz-Tekhnikum

[Abstract] A report on evaluation of fodder crops in three years of experiments on the Kagul Water-Conservation Sovkhoz-Tekhnikum in the flood-plain of the Prut River under conditions of taking three harvests per year from the same plot with and without irrigation. The soil on the experimental plot is sandy loam with humus content of 2.05%, nitrogen 0.16%,  $P_2O_5$  0.187% and  $K_2O$  -- 3.37%. The moisture content of the soil on the irrigated

section was maintained at 75-80% to a depth of 70 cm. The results of the research show that the following combinations of crops are effective for three harvests per year under the given geographical-climatic conditions: under irrigation -- first crop winter rye, second crop sudan grass mixed with soybeans, and third crop sudan grass. This rotation yielded 132 feed units per hectare and 19.72 centners of raw protein. Another good combination is vetch-oats followed by a mixture of maize and soybeans and a third crop of kohlrabi. This rotation gives a green mass of 856 centners per hectare, 106 feed units and 21.44 centners of raw protein. Yields were considerably lighter without irrigation.

USSR

#### NITROGEN NUTRITION OF SOYBEANS

Kishinev SEL'SKOYE KHOZYAYSTVO MOLDAVII in Russian No 4, Apr 78 p 35

CHERNOBROVINA, R., junior science worker at the soil science microbiology laboratory of the Moldavian Scientific Research Institute of Soil Science and Agrochemistry imeni N. A. Dima, Plodorodiye Scientific Production Association, candidate of biological sciences, YEMETS, N., agronomist and seed grower, Ivancha OPKh [expansion not known], and BATENINA, V., senior laboratory technician of the Institute of Soil Science and Agrochemistry

[Abstract] The article gives the results of a two-year study on soybean treatment with "nitragin" bacterial fertilizer and the feasibility of combining bacterial and mineral nitrogen fertilizers. It was found that under dry conditions the combination of nitragin with the minimum dose of mineral nitrogen ( $N_{20}$ ) was on a level with respect to yield and economy with a double dose of mineral nitrogen ( $N_{40}$ ). Under irrigated conditions, the most effective combination is nitragin +  $N_{60}$ . The experiments confirmed the high capacity of this legume crop for symbiotic nitrogen fixation even when large amounts of mineral nitrogen are used.

USSR

UDC 633.2/.4.002

RESULTS OF WORK OF A SPECIALIZED FARM FOR FODDER ON FLOODPLAIN LANDS OF ROSTOV OBLAST

Moscow ZHIVOTNOVODSTVO in Russian No 3 Mar 78 pp 34-38

CHISTKOV, N. I., director of the "Kalininskiy" specialized farm of the Oktyabr'skiy Rayon, Rostov Oblast and SHEVCHENKO, P. D., candidate of agricultural sciences, Donskoy Zonal Scientific Research Institute of Agriculture

[Abstract] The Rostov Oblast has over 300 thousand hectares of floodplain land. This is a report of the experience of the Kalininskiy specialized farm, established in this Oblast two years ago (1975?), to intensify fodder production in floodplain lands, and to introduce a number of measures for areal and fundamental improvement of the potential in organization of specialized farms for fodder production and livestock production. The legal and economic status of the farm is described; its activity is controlled by a Review Commission selected every two years by the Rayon Council. Specialists of the Donskoy institute have devised the system of improvements on the farm. The farm lies between the Don and Aksay rivers; 5571 hectares are used for agriculture, including 600 ha (irrigated), 625 ha (non-irrigated), 1229 ha haying and 3117 ha reforestation pastures. It is devoted to production of fodder: grain forage, green, succulent and coarse feeds, prepared granules, amidoconcentrated additives and grass meal. Fodder production improvements--contrast of yields before and after set-up of the farm--are tabulated in terms of output of fodder units and digestible protein. A chart of yearly production, by monthly periods, of various grasses and feed vegetables, is presented. Considerable attention is devoted to development of seeds of perennial grasses.

USSR

UDC 636.085/.087.002.612+636.22/28.084

QUALITY OF FODDERS AND NUTRITIONAL ADEQUACY OF CATTLE FEEDING ON SPECIALIZED FARMS

Moscow ZHIVOTNOVODSTVO in Russian No 3 Mar 78 pp 25-33

SOLNTSEV, K. M., professor, corresponding member VASKhNIL (All-Union Academy of Agricultural Sciences imeni Lenin), director All-Union Scientific Research Institute of Livestock Breeding (VIZh)

[Abstract] This is an extended discussion of the status of the title subject. Industrialization of dairy and beef production has posed

several requirements, one of which is nutritionally adequate feeding of the cattle on feedlots isolated from natural feedgrounds. Standards for fodders include established levels of dry substance, energy yield, raw protein, sugar, starch, fat, macro and micro (trace) elements, vitamins, enzymes, and ratios of sugar/protein, energy/protein and acid/base. The crude fodders must contain nutritionally-adequate, first class, components --grasses, hay, corn and feed concentrates; furnishing extra amounts of low-class components can't compensate for a deficiency of first class products in the fodder. Institutes concerned with establishing ration components for adequate nutrition of cattle are the VIZh (Solntsev, director) and the VNIIFBiP [expansion unknown]. Apparently, research on nutritional requirements of cattle has not been extensive and empirical feeding has been the rule. Research now includes studies on levels of raw materials in feed, on adjustment of levels to assure milk and meat production, on supplements, on chemical composition of raw materials, use of straw, energy requirements, production of packaging machinery (e.g., for briquet formation) and fundamental studies on biochemical requirements of good nutrition. Practical studies are underway on various farms, e.g., the Schchapovo dairy farm, and the Bologovski dairy in Kalininskaya Oblast.

USSR

UDC 577.171.6

ISOLATION AND CHARACTERISTICS OF SOME HYPOTHALAMIC PEPTIDES

Yerevan BIOLOGICHESKIY ZHURNAL ARMENII in Russian Vol 31 No 4 Apr 78  
pp 347-351 manuscript received 2 Nov 77

ARUTYUNYAN, A. A., GALFAYAN, V. T., AKOPYAN, T. N., DEMIRCHYAN, D. G.,  
KARAPETYAN, R. O. and GALOYAN, A. A., Institute of Biochemistry, Academy  
of Sciences ArmSSR

[Abstract] The importance of hypothalamus-produced hormones and physiologically-active compounds is presented as introduction to the current study which involves isolation, purification and establishment of structure of peptides from cattle hypothalamus. The latter peptides were isolated by ionexchange chromatography, gel filtration, paper chromatography, and high voltage electrophoresis on paper. Reagents and materials were obtained from non-Soviet sources, e.g., Sigma, USA; Roche, Austria (fluorescamine); Merck, USA, (o-phthaldialdehyde); Reanal, Hungary; CSSR (silufol); Schleicher and Schüll, FRG. The Farrand, USA, spectrofluorimeter was used. The physical chemical properties of the isolated peptides (viz., those compounds which react positively with chlorine, and display increase in number of aminogroups after alkaline hydrolysis) are tabulated. The substances are, essentially, short 5-6 membered peptides. The possible physiological role of the isolated peptides is currently under study. References 17: 5 Russian, 12 Western.

USSR

UDC 577.15.08

THIAMINE PYROPHOSPHOKINASE (E.C. 2.7.6.2) IMMOBILIZATION IN POLYACRYLAMIDE GEL

Minsk VESTSI AKADEMII NAVUK BSSR in Belorussian No 3, 1978 pp 66-68

VASKABOYEV, A. I. and CHERNIKEVICH, I. P., Department of Metabolic Regulation, Academy of Sciences Belorussian SSR

[Abstract] Conditions are described for the immobilization of thiamine pyrophosphokinase (TPPK; E.C. 2.7.6.2) in polyacrylamide gel. Subsequent comparative studies revealed a lack of any significant differences between the kinetic properties of the soluble and immobilized TPPK. At room temperature native TPPK was 50% inactivated after 8 h, whereas immobilized TPPK retained 80% activity after 3 days. Heating at 55°C for 10 min

resulted in complete loss of activity by the soluble enzyme but only a 40% loss of activity by the immobilized TPPK. Thus, immobilization of TPPK does not significantly alter its kinetic characteristics but markedly enhances its stability. Figures 2; references 11: 2 Western, 9 Russian.

USSR

UDC 612.433.014.43

REACTION OF CELLS OF THE ANTERIOR ZONE OF THE RAT HYPOPHYSIS TO EXTREME COOLING

Moscow BYULLETEN' EKSPERIMENTAL'NOY BIOLOGII I MEDITSINY in Russian  
Vol 85 No 6, Jun 78 pp 734-736 manuscript received 10 Oct 77

MONASTYRSKAYA, B. I. and SILINA, A. G., Laboratory of Neutron Investigations, Leningrad Institute of Nuclear Physics imeni B. P. Kostantinov, Academy of Sciences USSR

[Abstract] The effect of acute cold stress on DNA synthesis and cell reproduction in the anterior hypophysis was studied and diurnal cycles in changing thyrotrope state were traced. Fifteen male rats were subjected to a temperature of  $-10^{\circ}$  in a chamber for six minutes, and the hypophysis was extracted after 3, 6, 12, 18, or 24 hours, with three animals in each time group. Histological investigations showed that thyrotrope activation was maximal after 12 hours, with a mitotic index increase greater than in controls. Autoradiography with  $^3\text{H}$ -thymidine demonstrated that the labeled cell index was unaffected. The data indicate that cold stress causes thyrotrope mobilization with enhancement of corticotrope and other cell function. Unchanged DNA synthesis indicates mitotic acceleration in premitotic cells. Figures 3; references 5: 2 Russian, 3 Western.

USSR

UDC 612.112:578.085.23

FEATURES OF BLOOD CELL GROWTH IN A CULTURE CONTAINING POLYETHYLENE OXIDE  
400 CRYOPROTECTOR

Moscow BYULLETEN' EKSPERIMENTAL'NOY BIOLOGII I MEDITSINY in Russian Vol 85  
No 6, Jun 78 pp 729-731 manuscript received 21 Sep 77

PANKOV, YE. YA., MARKOVA, O. P., GLUSHKO, T. A. and YATSYNA, B. M.,  
Institute of Problems in Cryobiology and Cryomedicine, Academy of Sciences  
USSR, Khar'kov

[Abstract] The proliferative capacity of cultured human peripheral leukocytes in the presence of the cryoprotector polyethylene oxide 400 (PEO 400) was investigated using phytohemagglutinin stimulation. Experimental cells had predominantly small leukocytes, rather than the intermediate forms and blast cells found in controls. Morphology was unchanged. Mitotic index decreased by a factor of 2 on the addition of 5% PEO 400 and by a factor of 3 with 10%, while the quantity of cells found in each phase was lowered. PEO 400 may affect the lymphocyte surface to suppress normal phytohemagglutinin transformation. References 7: 3 Russian, 4 Western.

EAST GERMANY/BULGARIA

EXTRACTION OF PHYSIOLOGICALLY ACTIVE SUBSTANCES FROM VEGETABLE MATERIALS  
WITH THE AID OF ELECTRICAL DISCHARGES

East Berlin DIE PHARMAZIE in German Vol 33 No 2-3 Feb-Mar 78 pp 105-106  
manuscript received 15 Apr 77

DIMOV, Chr., Dr, Pharmaceutical Faculty, Medical College, Sofia, Bulgaria

[Abstract] The technique discussed involves conversion of electrical energy into mechanical energy through electrical discharge within the liquid, creating basically ultrasonic pulses resulting in cavitation processes. Tests were conducted for the optimization of the extraction of cytisine from seeds of *Cytisus laburnum*, glaucine from *Glaucium flavum*, santonine from *Artemisia maritima*, and the total seed alkaloid mixture from *Delphinium orientale*. The following parameters were varied: capacitor capacitance, capacitor charge voltage, duration of the discharge period, number of discharges in unit time, degree of comminution of the vegetable material, temperature of the extraction system, and the drug-extraction medium ratio. Full extraction under the optimum conditions was achieved in one (cytisine) to six (*Delphinium*) minutes. The mass-transfer coefficient is the major factor contributing to the outcome of the process; it may be calculated from the particle size of the vegetable material, the internal and external molecular diffusion coefficients, the thickness of the diffusion boundary layer, and the convective transport coefficient. The simplest way to accelerate extraction is to increase the number of discharges per unit time. Figures 2; references 14: 8 Russian, 5 Bulgarian, and 1 German.

USSR

UDC 612.627.014.423-06:612.273.2

CHANGES IN THE RAPID BIOPOTENTIALS OF RABBIT MYOMETRIUM UNDER CONDITIONS OF CHRONIC HYPOXIA

Moscow BYULLETEN' EKSPERIMENTAL'NOY BIOLOGII I MEDITSINY in Russian Vol 85 No 6, Jun 78 pp 667-669 manuscript received 8 Aug 77

KOTURBASH, T. V., Departments of Normal Anatomy and Operative Surgery, Ivano-Frankovsk Medical Institute

[Abstract] In order to study the effect of shutting off basic uterine blood vessels to intervene in postpartum atonic circulation, 18 nonpregnant rabbits which had previously given birth were subjected to silver chloride electrode implantation in the uterine horns and ligation of the uterine and/or ovarian blood vessels. Electrohysterograms showed that disturbance in uterine circulation led to decreases in frequency and amplitude of peak potentials depending on the degree and duration of hypoxia. Ligation of the ovarian vessels had the least effect, with a duration of 12 days, while simultaneous severing of both uterine and ovarian circulation had the greatest effect, with some changes lasting 45 days. The amplitude and frequency of biopotentials are gradually restored as collateral blood vessels establish compensatory circulation. Figures 3; references 15: 13 Russian, 1 Polish, 1 Western.

USSR

UDC 616.5-006-08:615.849.19

SKIN TUMOR TREATMENT BY A PULSED LASER

Leningrad VOPROSY ONKOLOGII in Russian Vol 24, No 1, 1978 pp 76-81

GAMALEYA, N. F. and POLISHCHUK, YE. I., Dept. of Biological Effects of Lasers of the Institute for the Problems of Oncology, Academy of Sciences Ukrainian SSR

[Abstract] After a brief description of a neodymium and a CO<sub>2</sub> laser apparatus for the treatment of tumors, comparative results of their treatment of 559 patients having malignant and benign tumors are analyzed. Of the total, 420 were treated by the neodymium and 139 by the CO<sub>2</sub> laser. Energy density was 300-400 joules per cm<sup>2</sup> for the neodymium laser for treating skin cancer and less for other types. The patients were observed from six months to seven years. Fifteen of 48 individuals having primary melanomas later developed metastases (2 died). Of a total of 105 with skin cancer, 4 had recurrences. The absence of side effects, speed of treatment, and its

precision, are advantages of laser treatment. It is ineffective in treating extensive nevus pigmentoses. The impluse nature of the neodymium laser hinders smooth and precise dosage. There should be further testing devices which are continuous or quasi-continuous, such as the CO<sub>2</sub> laser, but which radiate in the same regions of the spectrum as the neodymium one. Research is now being conducted on argon and dysprosium, and other lasers. Figures 1, references 16: 14 Russian, 2 Western.

USSR

UDC 576.8.095.14:535-31

SPECIFICITY OF THE EFFECT OF LASER UV RADIATION ON THE SURVIVAL OF MICROORGANISMS

Moscow DOKLADY AKADEMII NAUK SSSR in Russian, No 5, Apr 78, pp 1238-1240, manuscript received 29 Dec 77

GAVRILOV, A. G., MEN'SHONKOVA, T. N., PISKUNKOVA, N. F., POSPELOV, M. YE., FRAYKIN, G. YA. and RUBIN, L. B., Moscow State University imeni M. V. Lomonosov

[Abstract] *Chlorella*, the yeast *Candida guilliermondii*, and tobacco mosaic virus (TMV) were subjected to both ordinary and laser light ( $\lambda=265$  nm). The survival curves for the yeast were similar for the two exposures at energy levels of 100 J/cm<sup>2</sup> and below, ( $\tau=10^{-8}$  sec); at higher densities the laser produced a much greater drop in survival rate. The ratio of the dose of ordinary and laser light necessary to reduce the survival rate to 37% (*chlorella*) shows a rise at 4 watts/cm<sup>2</sup>, then levels off. It is assumed that the light produces an increase in biquanta photochemical reactions. This, in turn results in two triplet excited thymine bases, or the transition of a base to a triplet excited state and the formation of a dimer. The photon flux necessary ( $10^{20}$  quanta/cm<sup>2</sup>) corresponds to the observed increase in the effect of ultraviolet radiation. Coherent light also causes damage to DNA to be localized, compared to the more evenly distributed damage caused by ordinary light. Figures 2, references 11: 3 Western, 7 Russian.

USSR

UDC 619:616.995.42-084

## AEROSOLS OF AEROL-2 TO COMBAT IXODES TICKS

Moscow VETERINARIYA in Russian No 6 Jun 78 pp 61-63

KAN, P. T. and KHOLODOV, I. YA., All-Union Scientific Research Institute of Veterinary Sanitation

[Abstract] This is a report of trials of aerosolization of aerol-2 to establish its acaricidal activity and to determine an effective program for its application to combat imagos of *H. anatolicum*. The trials were carried out in a 29.6 M<sup>3</sup> sealed chamber at 18-20°, relative humidity 80-85%. The chamber was composed of clay, brick and concrete to emulate livestock breeding quarters. The aerol-2 was aerosolized with the RAA-1 apparatus. Success of the trial procedure is shown by tabulation. Aerosolization with aerol-2, 10 ml per M<sup>3</sup> under industrial conditions--at the Kolkhoz imeni Lenin, DagestanASSR--was only 97% effective, explained by inability to achieve complete sealing of premises. Increase of amount to 20 mg/M<sup>3</sup> gave 100% effectiveness. Aerol-2 is evaluated as an effective acaricide.

USSR

UDC 576.895.771: 595.771(5)

## NEW SPECIES OF MOSQUITO AEDES (OCHLEROTATUS) GUTZEVICHI SP. N. FROM CENTRAL ASIA (CULICIDAE)

Leningrad PARAZITOLOGIYA in Russian Vol XII, Iss 2, Mar-Apr 78 pp 177-182

DUBITSKIY, A. M. and DESHEVYKH, N. D., Institute of Zoology, Academy of Sciences Kazakh SSR, Alma-Ata

[Abstract] Research in the Balkhash-Alakul'skiy basin resulted in the discovery of a new species of mosquito. Its morphological characteristics put it in the *A. Caspius*. It is named the *A. gutzevichi*, after a Soviet specialist (A. V. Gutzevich). It differs morphologically and, more importantly, ecologically, from *A. mariaae*. The taxonomic characteristics of Gutzevich, Monchadskiy, and Shtakel'berg (1970) are utilized to distinguish it from *A. mariaae*. The hypopigium of males is similar to the *A. mariaae* group. However, the former have smaller basal warts and different shaped phallosomes, and no thorn on the basal wart. The size and pubescence of the siphon and the pigmentation of the stigmal plate hind valve is different from all *Aedes palaeartic*. Its presence in Kazakhstan and the areas adjacent to Mongolia, where there are no oceans, indicates its ecological difference from *A. mariaae*. Figures 3; references 4: 2 Russian, 2 Western.

NEW SPECIES OF MOSQUITO, *Aedes (Stegomyia) sibiricus* sp. n. (Culicidae)

Leningrad PARAZITOLOGIYA in Russian Vol 12, No 2, Mar-Apr 78 pp 170-176

DANILOV, V. N. and FILIPPOVA, V. V., Institute of Medical Parasitology and Tropical Medicine imeni Ye. M. Martsinovskiy, Ministry of Health USSR, Moscow; Zoological Institute, Academy of Sciences USSR, Leningrad

[Abstract] Studies of the mosquito collection at the Institute of Medical Parasitology and Tropical Medicine imeni Ye. I. Martsinovskiy and the Institute of Zoology indicate that *A. (S.) galloisi* really is a new species *A. (S.) sibiricus*. Most of the specimens are from the southern areas of Primorskiy Kray (Maritime Region) collected in 1975. The female, male and fourth stage of the larvae are described. They are in the *alvopictus* subgroup of the *Scutellaris* group. They are found south of the eastern taigal and Okhotsk okrugs of the European-Siberian provinces of the circumboreal subregion of the Palearctic. Figures 4; references 20: 15 Russian, 5 Western.

HUNGARY

POSSIBILITIES OF THE TOXICOLOGICAL EVALUATION OF PESTICIDES

Budapest MAGYAR ALLATORVOSOK LAPJA in Hungarian Vol 33 No 6 Jun 78 pp 412-418 manuscript received 19 Jan 78

VARNAGY, Laszlo, Dr, university lecturer, University of Agrosiences, Faculty of Agricultural Sciences in Keszthely, Plant Protection Institute (director: BOZAI, Jozsef, Dr, professor, candidate of agricultural sciences), Hygiene Section (acting section head: SZIGETI, Istvan, Dr, associate professor)

[Abstract] Toxicologic evaluations of pesticides are carried out in Hungary by three institutions under the jurisdiction of the Ministry of Health, one institution and various manufacturer laboratories under the jurisdiction of the Ministry of Heavy Industry, and many institutions under the jurisdiction of the Ministry of Agriculture and Food. The tests used for the evaluation include acute tests, subchronic tests, chronic tests, reproductive tests, mutagenic-effect tests, teratogenic-effect tests, blastomogen-effect tests, epidemiological tests, food analyses, and environmental-effect tests. The tests were briefly described and assessed on the basis of literature references. In view of the increased use of pesticides in Hungary (the active ingredients are domestically manufactured and imported), the importance of these tests increases as time goes on. It is important to standardize the tests and to equip the institutions where the tests are performed with more modern and efficient instruments. Additional training of testers is also recommended. Elimination of harm to individuals and the environment by pesticides can only be accomplished if these measures are implemented. Figure 1; references 36: 15 Hungarian, 4 German, and 17 Western.

USSR

UDC 577.4

SOME PRINCIPLES OF ECOLOGICAL MONITORING UNDER CONDITIONS OF BACKGROUND POLLUTION OF THE NATURAL ENVIRONMENT

Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 241 No 1 1978 pp 253-255 manuscript received 6 Mar 78

IZRAEL', YU. A., corresponding member of the Academy of Sciences USSR, FILAPPOVA, L. M., SEMEFSKIY, F. N., SEMENOV, S. M. and INSAROV, G. E., Institute of Applied Geophysics, Moscow

[Abstract] The problem of monitoring the environment to control contamination due to anthropogenic activity is examined. This article concerns

formulation of principles of observation and of study of the change in condition of ecological systems in the biosphere of national reservations (i.e., environments not exposed to serious contamination) subject to pollution of an anthropogenic character. Since identification of the ultimate response of living things to pollution of a milder nature would require an exceedingly long time, it is suggested that one employ mathematical models, based on data of laboratory work, as an aid to observation, evaluation and prognosis of response. Models of natural ecosystems already exist which can assist the prognosis of response to pollution. These models can be used to construct simple, "standard" models of typical ecosystems, forests, lakes, rivers and deserts. Ecological monitoring must supply information giving the parameters for corresponding, mathematical, prognostic models. Tracking the effects, of contamination, on a system of biological species is very difficult, and it is suggested that a sub-system be chosen, with extrapolation, in the model, of responses in the others. References 4, Russian.

USSR

UDC 615. 47.614.71-074-71

#### SIMPLE UNIFICATION OF AN ASPIRATOR

Moscow GIGIYENA I SANITARIYA in Russian No 4, Apr 78 pp 98-99, manuscript received 31 Jan 77

MIKHALYUK, V. Ye., Zaleshchitskaya Rayon Sanepidstation

[Abstract] The aspirator is produced by the Krasnogvardeyets Association and operates at 50 Hz and 220 volts, making it impossible to use in the field. It has been suggested to replace the KD-50 electric motor by a DC ME-218 motor. Here it is suggested to fit a T junction (pictured) and connection adapting the device for standardized use in the field. The short cord should be replaced by a 15-20 cm one. The connection is manufactured at several motor vehicle plants. Prior to operation it can be screwmounted. When the aspirator is operating on alternating current the connection can be closed. This version is reliable and requires no changes in the plant design. Figures 2; references 2, Russian.

USSR

UDC 613.298:648.54

EXPERIENCE IN USE OF AMMONIA FOR THE PURPOSE OF DESTROYING OF ASCARID  
OVA IN THE SEWAGE SLUDGE ON SLUDGE BEDS

Moscow GIGENA I SANITARIYA in Russian No 4, Apr 78, pp 100-102, manuscript  
received 20 Apr 77

CHERFANOVA, YU. A., BUKHTOYAROV, A. I. and YASTREBOV, YE. YE., Institute  
of Medical Parasitology and Tropical Medicine imeni Ye. A. Martsinovskiy,  
Ministry of Health USSR, Moscow

[Abstract] Good results have been obtained in the use of ammonia in  
concentrations ranging from 20 to 99.9%  $\text{NH}_3$  in order to destroy such eggs.  
Domestic and industrial sludge at Klin was subjected to tests during  
1971-1974 to determine the efficiency of this method. Ammonia was applied  
from a small trailer tank subsurface, at a 4% concentration (with respect  
to sludge mass). At such dosage only dead eggs were observed after 10  
days, while with a 2% dosage, up to 60% of the eggs were surviving after  
30 days. Under semi-production conditions, 5 sections were subjected to  
different applications, at doses of 4%, eggs were killed in all tests;  
using a 3% dose and at temperatures of 14-16 degrees C, the eggs were  
completely eliminated, while in areas where no ammonia was applied more  
than 90% of the eggs survived. The sludge maintains its value as a  
fertilizer. Figures 2; references 4, Russian.

USSR

UDC 614.715/ .72:625.712.4

CHOICE OF AN ARRANGEMENT ALONG HIGHWAYS OF PLANTATION BELTS ACCORDING TO  
THEIR GAS PROTECTING PROPERTIES

Moscow GIGIYENA I SANITARIYA in Russian No 4, Apr 78, pp 106-108, manuscript  
received 19 Jul 77

SIDORENKO, V. F., candidate of technical sciences, BALAKIN, V. V. and  
GEL'DMAN, YU. G., doctor of medical sciences, Volgograd Engineering Con-  
struction Institute; Institute of General and Communal Hygiene imeni  
A. N. Sysina, Academy of Medical Sciences USSR, Moscow

[Abstract] Several alternatives for greenbelts along highways were tested  
at an experimental facility and along highways in Moscow, Kishinev, and  
Volgograd. Efficiency in gas absorption ranged from 5% for shrubbery to  
38% for two rows of trees with 1.6 meter high shrubbery between them.  
In comparison, an impervious screen is from 46 to 60% effective. Efficiency  
also depended on the so-called coefficient of azhurnost' (the ratio of the

area occupied by trunk, leaves, and branches to the total frontal area of the belt). This ranges from 0.72 for shrubbery to 0.41 for the two rows of trees and shrubbery). A scatter diagram shows the dependence of gas protection efficiency upon this factor and upon height. For plantings of the same height it increases as the coefficient increases. A formula for such efficiency is also presented, depending upon CO concentration, on each side of the belt. Tall trees with short branch-free trunks leaves should be selected. Figures 1; references 4, Russian.

USSR

UDC 614.72:621.311.21

#### SOME NEW DATA ON ATMOSPHERIC POLLUTIONS WITH DISCHARGES OF LARGE THERMAL-ELECTRIC POWER STATIONS

Moscow GIGIYENA I SANITARIYA in Russian No 4, Apr 78, pp 4-8 manuscript received 30 Apr 77

GIL'DENSKIOL'D, R. S., RIKHTER, B. V., KUZ'MICHENVA, M. N. and RYZHKOVSKIY, V. L., Moscow Scientific Research Institute of Hygiene imeni F. F. Erisman

[Abstract] Instruction SN 369-74 provides the theoretical and experimental basis for studying atmospheric pollution of large thermal electric stations. It has been necessary to verify its suitability for high stack discharge and discharge from stations burning mazut with high sulfur content and containing compounds of vanadium and nickel. The study, made near the Kostroma GRES, took all air pollution indicators into consideration. Sulfur content in the fuel ranged from 2 to 3% and emissions of sulfur amounted to 5,170 - 8,020 grams/second. A diagram presents the results on 2,000 samples within a 12 kilometer radius. In all cases the average maximum was lower than the figure computed according to SN 369-74. The maximum SO<sub>2</sub> was some distance from the source, at 2 kilometers (0.24 mg/cu. meter). Measures should be taken to prevent the formation of nitrogen oxides during fuel combustion. At distances close to the station, oxides of S and N are the main sources of air pollution. There is close correlation of results from photometric measurements and from computations of SO<sub>2</sub> concentrations. The low content of SO<sub>2</sub> and NO<sub>2</sub> indicate that the station was operating at optimal conditions during the tests. The ratio of SO<sub>2</sub> and NO<sub>2</sub> was 2:1, lower than for other studies (around 7:1). Vanadium content ranged from 0.025 to 0.050 micrograms per cubic meter at 1 - 10 km from the source; nickel content was 0.097 micrograms at 5 km and 0.120 at 10 km, lower than the maximum permissible concentration of 1.0. Figures 1, references 9: 8 Russian, 1 Western.

## ORGANIZATION AND CONDUCT OF SANITARY SUPERVISION TO CONTROL ATMOSPHERIC POLLUTION AT THE CITY OF DONETSK

Moscow GIGIYENA I SANITARIYA in Russian No 4 Apr 78, pp 53-57 manuscript received 7 Dec 76

GRIN', N. V., SOLOV'YEV, V. I., GALUSHKO, A. P., RUDCHUK, Z. YA. and MIROSHNICHENKO, V. YU., Donetsk Medical Institute; Oblast and City Sanepidstation, Donetsk

[Abstract] In 1969 the air pollution laboratory at the Donetsk city sanepidstation was created. Its staff included a chief, a lab technician, and three assistants. A study of work results prior to 1973 indicated the necessity of strengthening contacts with concerned organizations and of improving the quality and organization of inspections. Its prestige has improved. The lab has written instructions and conducted seminars. During 1976 it studied 19 plans of industrial projects with respect to air pollution problems and made changes in 10 of them. In the same year it found 3 deviations from designs and 24 cases of poor quality installation. Also, 190 gas scrubbers were installed at 43 projects. In 1975 the construction of 11 projects was stopped because of air pollution violations. In 1974 a special section was set up to extinguish fires at smouldering mine tailings. During 1973-1976, 47 exhaust gas analyzers and 15 diagnostic centers were set up at motor vehicle transport enterprises. Thirteen production operations and 10 process assemblies polluting the atmosphere have been closed. As a result, by 1975, sulfuric acid and dust content have been reduced to 20% and 40% respectively of their 1970 figure. The CO content was reduced by 36% compared to 1974, and phenol content reduced by 12%. No references.

## HYGIENIC ASSESSMENT OF SOVKHOZ SETTLEMENTS ON NEWLY CULTIVATED LANDS IN THE KARSHINSKAYA STEPPE

Moscow GIGIYENA I SANITARIYA in Russian No 4, Apr 78, 92-93 manuscript received 26 Aug 77

GELLER, I. M., candidate of medical sciences, BOCHKAREVA, L. A. and ACHIL'DIYEVA, P.A., Uzbek Scientific Research Institute of Sanitation, Hygiene and Occupational Diseases, Tashkent

[Abstract] Sovkhoz on the newly developed steppe are arranged in a central farmstead with one and two story buildings, permitting the concentration of service facilities. The protective belts (300-500 meters wide) may not be sufficient to protect the population from pesticides. Studies from the Uzbek Scientific Research Institute for Sanitation, Hygiene and Occupational Diseases indicate that they should be at least 1,000 meters wide. The majority of the buildings (65%) are oriented in a NNorthwest-SSoutheast direction, most favorable for this area. The production and residential areas are sharply separated. At most sovkhov settlements the construction of medical facilities has not begun and there have been delays in opening schools. The buildings are made from silicate concrete and brick. Water supply is centralized, except for one farm. The buildings were examined and the population was questioned. Each family has a plot of 800 square meters directly adjacent to the house. The most suitable were OBPS -3,4,5, and 164-AP. Buildings in the 1-15-22 series have a 45 degree staircase, which is excessively steep. Garbage removal does not meet sanitary requirements. Greenery has not been planted and consequently the settlements are not protected from winds. The high dust content in the region prevents direct ventilation. It is recommended to provide all facilities. References 1, Russian.

USSR

UDC 615.47:614.73-07-71

DEVICE FOR TAKING SAMPLES FOR DETERMINING THE QUANTITY OF RADIOACTIVE  
SUBSTANCES THAT ARE BLOWN OFF FROM THE SURFACE OF VEHICLES AND ROAD  
SURFACES

Moscow GIGIYENA I SANITARIYA in Russian No 4, Apr 78, pp 83-84 manuscript  
received 26 May 77

MASLOVSKIY, R. YA., candidate of medical sciences

[Abstract] The device is used for field sampling of contamination of such surfaces. Looking somewhat similar to a small tire pump (it is illustrated), it has a swivel cover to protect the opening. The device has a special metal ring attachment. When taking samples, the cover is swung aside and the opening is placed upon the surface. The pump volume is 350 cu cm., with a 6.3 cm<sup>2</sup> opening it works at a rate of 0.55 meters per second, and with a 12.5 cm<sup>2</sup> opening at 0.28 meters/sec. Field tests were made on transportation equipment and the filters sent to a lab. No specific data on contamination levels are presented. The device is good for dry surfaces and for surfaces which can be secondary sources of contaminants. Figure 1, references 0.

USSR

UDC 597.0/5-11

EFFECT OF MERCURY DICHLORIDE ON SOME BIOCHEMICAL CHARACTERISTICS OF BRAIN, BLOOD, AND LIVER IN RUTILUS RUTILUS CASPICUS (JAK)

Moscow VOPROSY IKHTIOLOGII in Russian No 1, 8m pp 177-180 manuscript received 12 Jul 77

DOKHOLYAN, V. K. and AKHMEDOVA, T. P., Dagestan Department of the Caspian Scientific Research Institute for Fisheries, Makhachkala

[Abstract] Rutilus was subjected to various concentrations of mercury dichloride (100, 10, and 5 micrograms/ml). Brain tissue was then tested to determine nitrogen and carbon metabolism. All the fish in the highest concentration died, while those in the latter groups showed marked changes in metabolism. Ammonia content increased 135% in the first day, then dropped. Data on nitrogen metabolites are presented in two tables. For young fish (1 year), the ammonia content only increased 79%. Protein content in blood was reduced by 20-22% within 3 days then started to increase. There was an increase in alpha and beta globulins, a drop in blood sugar and liver glycogen. References 9: 3 Western, 4 Russian, 1 German, 1 Czech.

USSR

UDC 577.158.45:15.062

KINETIC CHARACTERISTICS OF THE ASPARTATE-AMINOTRANSFERASE REACTION  
CATALYZED BY FREE CELLS OF ESCHERICHIA COLI

Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 241 No 1 1978 pp 242-245  
manuscript received 18 Mar 78

PHAM VAN NGUYEN, YAKOVLEVA, V. I., MALOFEYeva, I. V., VARFOLOMEYEV, S. D.  
and BEREZIN, I. V., corresponding member of the Academy of Sciences USSR,  
Moscow State University imeni M. V. Lomonosov

[Abstract] Although free and immobilized cells of microorganisms have been finding ever-increasing use in transformation of steroids, hydrocarbons, organic acids and nucleotides and in the synthesis of amino acids and other compounds, no reports are available on the kinetics of the reactions catalyzed by the microorganism cells. This report concerns a determination of kinetic parameters of the title reaction. Materials used were L-aspartate, 2-hydroxyglutarate, aminotransferase (KF 2.6.1.1) and E. coli strain 85 (from the collection of the Department of Microbiology, Biology Faculty, Moscow State University). The study used L-aspartic acid, pyridoxal phosphate (Reanal, Hungary), alpha ketoglutaric acid (USSR), E. coli, form A, aspartate aminotransferase and E. coli strain 85 (from the collection of the Department of Microbiology, Biology Faculty, Moscow State U.). Graphs are presented of the kinetic curves of accumulation of oxalacetic acid as a function of reaction time. Findings were viewed from the aspect of the free cell as a membrane microreactor, as conceived by one of the authors (Varfolomeyev, 1976-78). Kinetic characteristics are listed, as mathematically derived. Figure 1; references 11: 6 Russian, 5 Western.

USSR

UDC 619:615.777/.779:631.51

TOXICITY OF VITAVAX FOR CHICKENS

Moscow VETERINARIYA in Russian No 6 Jun 78 pp 85-86

PADALKIN, I. YA., All-Union Scientific Research Institute of Non-Contagious Diseases of Animals

[Abstract] Vitavax (USA) is presently recommended for treatment of grain seeds in the amount of 2.5-3.5 kg/t in the form of a 75% wetting powder. This article reports an investigation of any potential danger for chickens following vitavax ingestion. The LD<sub>50</sub> of the agent was found to be 24 thousand mg/kg; coefficient of accumulation was more than 5. The agent is thus slightly toxic and mildly accumulative for chickens; chances of acute poisoning under industrial conditions are slight. Prolonged administration of 1/100 of the LD<sub>50</sub> does evoke toxic symptoms in 10 days. Symptoms of chronic poisoning are manifested by the digestive and cardiovascular systems. Slaughter of cattle and birds which have ingested vitavax should be delayed until two weeks after removal of the agent from the fodder.

USSR

UDC 613.62:661:546.137-32

HYGIENIC EVALUATION OF WORK CONDITIONS AT THE SHOP FOR THE INTEGRATED PURIFICATION INSTALLATION AT A PLANT FOR CHLOROORGANIC PRODUCTS

Baku AZERBAYDZHANSKKY MEDITSINSKIY ZHURNAL in Russian and Azerbaydzhanian No 10, Oct 77, pp 36-40

ALIVERDIYEVA, SH. S., Azerbaydzhian Scientific Research Institute for Labor Hygiene and Occupational Diseases imeni M. M. Efendizade

[Abstract] Conditions at this facility have been previously studied. The equipment for the removal of hydrocarbons and acids from waste water requires constant attention (85-90% of work time). Consequently, workers are exposed to fumes. During the handling of lime, its concentration in the air ranges from 2.1 to 80.3 mg/m<sup>3</sup>, and in unloading bunkers, the figure is 60 to 120 mg/m<sup>3</sup>. Hydrocarbon content is much higher (up to 1,500 mg/m<sup>3</sup>). This is due to the extensive surface area of machinery and poorly sealed equipment. It varies, depending upon weather conditions, being highest at high temperatures (partially caused by the equipment), and low winds. It is recommended to better seal equipment and containers, improve ventilation, eliminate leakage of waste water at pump facilities, and mechanize the handling of sludge. References 1, Russian.

## DETERMINATION OF CHLOROORGANIC PESTICIDES IN THE SALTWATER OF LAKES AND ESTUARIES

Moscow GIGIYENA I SANITARIYA in Russian No 4, Apr 78, pp 78-79 manuscript received 4 May 77

KUCHER, A. G., RAKOV, A. A. and SAPEGIN, D. I., Crimean Medical Institute, Simferopol'

[Abstract] The brine from lakes used for curative purposes which are located near agricultural lands where pesticides are widely used is subject to pollution. The assay method recommended by the Scientific Institute of Experimental Meteorology in 1974 is not suitable. The modified method uses an additive of 15 ml of N hexane which is evaporated to obtain an extract. A few drops are condensed and subjected to chromatographic analysis. These data are compared to controls. The resulting samples are processed by accepted methods and subjected to ultraviolet radiation and photographed. This method avoids the formation of precipitates. The use of a microphotometer results in a more objective comparison. The mean square error  $\pm 9\%$ , compared to a figure of 20% for the visual method and 15% for comparative measurement. No data on contamination levels are presented. The samples were taken from Saks koye and Maynaks koye lakes in the Crimea. References 3, Russian.

## EAST GERMANY

STUDIES ON THE USE OF PARAFORMALDEHYDE TABLETS TO REDUCE THE BACTERIAL COUNT, TO DISINFECT, TO COLD-STERILIZE, AND TO STORE MEDICAL INSTRUMENTS IN A STERILE MANNER. PART 2: DETERMINATION OF THE FORMALDEHYDE RELEASED IN THE GAS PHASE BY PARAFORMALDEHYDE TABLETS

East Berlin DIE PHARMAZIE in German Vol 33 No 2-3 Feb-Mar 78 pp 103-104  
manuscript received 7 Jun 77

SCHILLING, B., pharmacist; WEUFFEN, W., professor, Dr; and WIGERT, W., Dr, Research Institute for Hygiene and Microbiology, Bad Elster, Disinfection Reference Laboratory of the German Democratic Republic (director: DOBBERKAU, H.-J., senior medical counsellor, professor, MD), and Department of General and Communal Hygiene (head: WEUFFEN, W., professor, doctor of medical and natural sciences), Ernst Moritz Arndt University, Greifswald

[Abstract] The apparatus used for the determination of the gaseous formaldehyde released by paraformaldehyde tablets is a modified version of that described by L. Sujbert in ARCH. HYG., 1964, p 195. Basically, the method used is that described by Bremanis in Z. ANALYT. CHEM., 1949-50, p 44. The released formaldehyde is entrained in a flow of nitrogen carrier gas, fed into a water-filled impinger (where the formaldehyde dissolves in the water), an aliquot portion of the solution is combined with chromotropic acid and sulfuric acid, and the resulting mixture analyzed for formaldehyde by means of spectrophotometry. Data obtained with the aid of this method for various conditions simulating actual use were presented and discussed. The factors considered for establishing the active formaldehyde concentration (which is the primary disinfecting and sterilizing parameter) include the amount of paraformaldehyde present, the volume of the enclosed space, the temperature in the enclosed space, possibilities for gas exchange, and the relative atmospheric humidity. The aim in using the paraformaldehyde tablets is to achieve an equilibrium formaldehyde concentration in the enclosed space which is optimum for the intended purpose. Three 1 g tables of paraformaldehyde provide the optimum formaldehyde concentration for microbicidal performance in a 130 cu cm enclosed space under the usual conditions. Approximately 98 percent of the paraformaldehyde depolymerization product is formaldehyde. The time required for the establishment of the equilibrium formaldehyde concentration in the enclosed space is primarily a function of the amount of paraformaldehyde present. Figures 3; references 12: 6 German and 6 Western.

## STUDY OF THE WAYS IN WHICH E. COLI 055 PENETRATES THE INTESTINAL WALL OF GNOTOBIOTIC AND CONVENTIONAL ANIMALS

Moscow BYULLETEN' EKSPERIMENTAL'NOY BIOLOGII I MEDITSINY in Russian  
Vol 85 No 6, Jun 78 pp 654-657 manuscript received 10 Oct 77

CHERNUKH, A. M., PODOPRIGORA, G. I. and KRANCHEV, A. K., Institute of General Pathology and Pathological Physiology, Academy of Medical Sciences USSR; Scientific Research Laboratory of Experimental Biological Models, Academy of Medical Sciences USSR, Moscow

[Abstract] The dependence of the permeability of the intestinal barrier to E. coli 055 on an associated microbial factor and the way in which microorganisms penetrate the intestinal wall were studied using germ-free and conventional guinea pigs and rats. Gnotobiotic animals demonstrated a monotypic pattern of increasing bacteriemia in cardiac blood cultured 30 minutes and 2, 4 and 24 hours after peroral contamination with E. coli, while in conventional animals the bacteriemia was transient. Electron microscopy of intestinal sections with macroscopic signs of inflammation revealed pathological changes in germ-free animals, disturbance of intercellular contact, bacteria and red and white cells in the canals between the enterocytes and more pronounced changes in the microvessels of the mucous membrane. Normal animals had almost no change in intercellular contact, and more active phagocytosis. The data indicate that adaptive changes caused by the presence of intestinal bacteria, such as connective tissue development, mucous membrane thickening, elaboration of biologically-active substances, increased muscle tone, enzyme activation and faster DNA synthesis and red blood cell renewal play a very important role in the prevention of bacteriemia in the normal animal. Figures 3; references 15: 5 Russian, 10 Western.

EAST GERMANY

USE OF PHARMACEUTICALS IN THE FIELD OF DIVING MEDICINE

Greifswald ZEITSCHRIFT FUER MILITAERMEDIZIN in German Vol 19 No 3 Jun 78  
pp 123-124 manuscript received 10 Feb 78

PADELT, H., lieutenant-colonel

[Abstract] This article is a summary of the author's paper delivered at the 21-22 November 1977 scientific conference of the East-German Association of Military Medicine on Pharmaceuticals and Psychophysical Performance, held in Dresden. Proficiency in diving is a result of various factors such as individual suitability as determined by medical and psychological testing, training, and safety measures. Among the individual characteristics which are important in this connection are the so-called sanogenetic mechanisms (which are triggered by pathogenic stimulation and may be of normal- and pathophysiological character, and which may be primary or secondary). A review is presented of the effects of pharmaceutical agents on decompression phenomena, effects of pharmaceutical agents on oxygen toxicity, influencing of the narcotic effects of inert gases by pharmaceutical agents, and influencing of hypercapnia by pharmaceutical agents. Pharmaceutical agents in connection with diving activities must be used only as recommended by the specialist physician, and side effects must be taken into consideration. Although we know much about the sanogenetic mechanisms, pretesting of individuals for suitability as divers, and effects of various pharmaceutical agents, we still do not have a "diver's pill" which will eliminate all hazards and contribute to the success of diving assignments. No references.

EAST GERMANY

TERM DEFINITION AND MEASUREMENT OF PERFORMANCE FROM THE FLIGHT-MEDICAL AND THE FLIGHT-PSYCHOLOGICAL POINT OF VIEW

Greifswald ZEITSCHRIFT FUER MILITAERMEDIZIN in German Vol 19 No 3 Jun 78  
pp 118-119 manuscript received 10 Feb 78

FRIEDRICH, J., colonel, MD; ULLRICH, B., major, MD and VAIC, H., graduate psychologist

[Abstract] This article is a summary of the authors' paper delivered at the 21-22 November 1977 scientific conference of the East-German Association of Military Medicine on Pharmaceuticals and Psychophysical Performance, held in Dresden. The components contributing to psychophysical performance

were reviewed with the aim of developing a valid and universally applicable definition of psychophysical performance, especially insofar as this term is used in flight medicine and flight psychology. The factors are classified as external (environmental, flight-engineering, etc.), task-oriented (mission-oriented), and person-oriented (physiological and psychological). The methods and procedures involved in measuring psychophysical performance were reviewed. They are classified as suitability-diagnostic methods and procedures, and condition-diagnostic methods and procedures (for establishing an individual's suitability for a given duty and for establishing the duties for which a given individual would be suitable, respectively). Further studies are needed for full competence in the field of determining and evaluating the psychophysical performance in the areas of flight medicine and flight psychology. These studies should be made with standardized techniques. Figures 4; references 5: 3 German and 2 Russian.

#### EAST GERMANY

#### PROBLEMS OF TERM DEFINITION, DETERMINATION AND EVALUATION OF PSYCHOPHYSICAL PERFORMANCE FROM THE MILITARY-MEDICAL POINT OF VIEW

Greifswald ZEITSCHRIFT FUER MILITAERMEDIZIN in German Vol 19 No 3 Jun 78  
pp 111-114 manuscript received 10 Feb 78

TRZOPEK, H.-G., lieutenant-colonel, MD; and WERNER, G., colonel, medical counsellor, doctor of medical sciences

[Abstract] This article is a summary of the authors' paper delivered at the 21-22 November 1977 scientific conference of the East-German Association of Military Medicine on Pharmaceuticals and Psychophysical Performance, held in Dresden. Studies were carried out which indicated that the term "psychophysical performance" lacks a precise and universally accepted definition. The need for such a definition is evident, however. A possible definition would be the following: "Psychophysical performance is a complex biological value expressing the ability of a human to perform a defined level of activity consciously under precisely defined conditions." Defined in this manner, psychophysical performance is affected by internal and external factors, the degree of adaptation, and the existing motivation. In theory, psychophysical performance may be measured in a quantitative manner. But it is practically impossible to establish a universally valid standard. The limitations of human endurance are not set down once and for all by permanent biological standards; they vary. There are specific performance levels under various sets of conditions. The most important

task in this area is to standardize the methods of testing and measurement to permit useful results to be obtained. Then, the evaluation of the effects of psychopharmaceutical agents could be made in a more meaningful way. Figures 2; no references.

#### EAST GERMANY

#### POSSIBILITIES AND LIMITATIONS FOR ACHIEVING HIGH PHYSICAL ENDURANCE BY MEMBERS OF THE PEOPLE'S ARMY (NVA) IN COMBAT TRAINING

Greifswald ZEITSCHRIFT FUER MILITAERMEDIZIN in German Vol 19 No 3 Jun 78  
pp 108-111 manuscript received 10 Feb 78

GESTEWITZ, H. R.; lieutenant-general, senior medical counsellor, professor, doctor of medical sciences

[Abstract] This article is a summary of the author's paper delivered at the 21-22 November 1977 scientific conference of the East-German Association of Military Medicine on Pharmaceuticals and Psychophysical Performance, held in Dresden. It is based on the evaluation of 757 references, an analysis of 5,192 case records, and comparative studies on 2,241 individuals in the 12-20 and 21-55 year age groups. Both psychic and physical factors were considered, since both contribute to the achievement of high physical endurance under combat conditions. It became evident that (1) the possibilities and limitations for achieving high physical endurance are significantly affected by the psychophysical performance; (2) the psychic factors contributing to psychophysical performance begin to develop in the youth period (and may be affected during this period); (3) regular fitness exercises of the proper kind, as developed and used by the armed forces, contribute to psychophysical performance; (4) the general health condition contributes significantly to psychophysical performance; and (5) the periods between 12-17 years of age are the most decisive in the formation of the ultimate psychophysical performance. Pharmaceutical agents may have a place among the means used in combat training. Figures 2; no references.

EAST GERMANY

SCIENTIFIC CONFERENCE OF THE EAST-GERMAN ASSOCIATION OF MILITARY MEDICINE  
ON PHARMACEUTICALS AND PSYCHOPHYSICAL PERFORMANCE, 21 TO 22 NOVEMBER 1977,  
HELD IN DRESDEN

Greifswald ZEITSCHRIFT FUER MILITAERMEDIZIN in German Vol 19 No 3 Jun 78  
p 108

[Unattributed article]

[Abstract] The purpose of the conference was threefold: (1) to contribute to the progress of knowledge in the subject field in general, and insofar as it affects military medicine in particular; (2) to demonstrate the superiority of socialist health care in general, and its beneficial effects on psychophysical performance in particular; and (3) to discuss and present new methods of diagnosis and therapy related to the use of pharmaceuticals for improved psychophysical performance. The scientific leaders of the conference were G. Werner, colonel, medical counsellor, professor, doctor of medical sciences; and W. Oelssner, professor, doctor of medical sciences. The papers presented at the conference were in three categories: (1) Psychophysical performance and defense; (2) methods for the objectivization of psychophysical performance; and (3) effect of pharmaceuticals on psychophysical performance. In addition, some review papers were also presented. Detailed summaries of the papers presented at the conference will be presented in this journal. The first set of summaries is in the present issue. The summaries were prepared by R. Seidel, major, MD; W. Stein, reserve major, medical counsellor, MD; and W. Pries, major, MD. No references.

EAST GERMANY

SIGNIFICANCE OF BASIC MEDICAL CARE IN THE ORGANIZATION OF THE HEALTH-CARE PROGRAM OF THE NATIONAL ARMED FORCES (VOLKSARMEE)

Greifswald ZEITSCHRIFT FÜR MILITÄRMEDIZIN in German Vol 19 No 3 Jun 78  
pp 98-100 manuscript received 13 Mar 78

GESTEWITZ, H. R., lieutenant-general, Medical Corps, senior medical counsellor, professor, dr of medical sciences; REHWALD, G., major-general, Medical Corps, senior medical counsellor, professor, dr of medical sciences and BARTSCH, K., colonel, Medical Corps, senior medical counsellor, doctor of medicine

[Abstract] The implementation of the resolution of the Ninth Congress of the Socialist Unity Party (SED) promulgating that medical and social care of the public must be intensified so as to increase the standard of living in material and cultural terms; to maintain, improve, and restore the health, performance, and satisfaction of the public; and to prevent, recognize, and eradicate diseases was discussed insofar as it pertains to the National Armed Forces (NVA), the Volksarmee. The implementation involves activities in the following areas: establishment of the required facilities and training programs for the increased tasks, monitoring and intensification of the health-care activities, upgrading the level of training and education of the health-care personnel both in terms of medical knowledge and political awareness, making best use of the experiences of the Soviet military-medical services, and demonstrating major improvements along these lines by the 30th anniversary of the foundation of the German Democratic Republic. Until 1980, emphasis in the upgrading of the military-medical service will be on expanding of the basic health care of the members of the NVA and their families. Civilian employees of the NVA must also be included in the coverage. References 3, German.

USSR

UDC 576.809.5:632.937.15

GC-SPECIFIC ENDONUCLEASE FROM BAC. THURINGIENSIS

Yerevan BIOLOGICHESKIY ZHURNAL ARMENII in Russian Vol 31 No 4 Apr 78  
pp 422-424 manuscript received 13 Jun 77

CHARCHOGLYAN, A. A., ZAKHARYAN, E. G., KARAGESYAN, K. S., SAFARYAN, A. S.,  
AZARYAN, N. G. and ZAKHARYAN, R. A., Institute of Experimental Biology,  
Academy of Sciences ArmSSR

[Abstract] The increasing use of various enzymes (endonucleases, exonucleases, etc.), from different bacterial species, to study the structure of DNAs and to create recombinant molecules, stimulated this study of the endonuclease derived from Bac. thuringiensis, strain 1000. The specific recognition of a definite sequence of DNA by the enzyme was studied with use of actinomycin D whose attachment with DNA is known to be determined by affinity to guanine residues but also by the alternation of the latter with cytosine. Tabulation of data obtained by treatment of DNA lambda B<sub>2</sub> with actinomycin D at various concentrations indicated that GC pairs define the endonuclease recognition. Figures 2; references 6, Western.

USSR

UDC 613.15:669.2/.8:631.523

CYTOGENETIC ACTION OF INORGANIC COMPOUNDS OF TUNGSTEN, ZINC, CADMIUM AND COBALT ON HUMAN AND ANIMAL SOMATIC CELLS

Kiev TSITOLOGIYA I GENETIKA in Russian Vol 12 No 3 May/Jun 78 pp 241-243  
manuscript received 8 Feb 77

VOROSHILIN, S. I., PLOTKO, E. G., FINK, T. V. and NIKIFOROVA, V. YA.,  
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[Abstract] The human material was male donor blood leukocytes of which were cultured (Moorehead and Nowell (1960); cells studied were at the stage of the cellular cycle G<sub>0</sub>; the cells had been subjected to the action of the mutagen for 2 hr prior to cultivation. The animal material was bone marrow gotten from male rats exposed to zinc oxide aerosol. Frequency of cells with chromosome damage in a culture of human leukocytes exposed to the action of Zn, Wo, Cd and Co, and chromosome damage in rat bone marrow exposed to chronic ZnO inhalation, are tabulated. A rise in frequency of cells with structural chromosome aberrations and hyperdiploid cells was seen after the action of 7.0-21.0 mcg/ml Zn acetate and of

hyperdiploid cells after the action of 10.0-30.0 mcg/ml sodium tungstate, 1.0-10 mcg/ml Cd acetate and 0.06-0.6 mcg/ml Co acetate. Rat bone marrow cells showed a rise in frequency of hyperdiploid cells after the aerosol action of ZnO in concentrations of 0.1 and 0.5 mg/m<sup>3</sup>. References 13: 7 Russian, 10 Western.

USSR

UDC 576.851.48.097.2:575

COMPATIBILITY OF F-LIKE PLASMID FBldrd WITH THE STANDARD F-GROUP PLASMIDS IN E. COLI K12 STRAINS

Moscow BYULLETEN' EKSPERIMENTAL'NOY BIOLOGII I MEDITSINY in Russian  
Vol 85 No 6, Jun 78 pp 718-719 manuscript received 12 Jul 77

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[Abstract] The compatibility of the F-like plasmid FBldrd, previously identified by the authors in E. coli serotype 06, with F plasmids of the six compatibility groups was studied. E. coli AP106 containing standard F1 to F6 plasmids was used as the donor of genetic material, while the recipients were two strains containing FBldrd plasmid in the integrated state and produced to be lactose positive and negative. Plasmid F'lac+ had a significantly lower rate of transfer, indicating marked surface exclusion. For the other plasmids, exclusion was less marked or absent. All plasmids were compatible with FBldrd, able to exist in a stable manner together with it in the cell. The results indicate that plasmid FBldrd belongs to a new compatibility group which is proposed to be designated FVII. References 6: 2 Russian, 4 Western.

## NONSPECIFICITY OF THE ACTION OF ANTIVIRAL PROTEIN

Moscow BYULLETEN' EKSPERIMENTAL'NOY BIOLOGII I MEDITSINY in Russian  
Vol 85 No 6, Jun 78 pp 720-721 manuscript received 4 Oct 77

SOKOLOVA, T. M., KISLING, U. and YERSHOV, F. I., Institute of Virology  
imeni D. I. Ivanovskiy, Academy of Medical Sciences USSR, Moscow

[Abstract] The activity of antiviral protein m-RNA was studied in homologous and heterologous cells in order to clarify the specificity of its translation. Interferon superinduction was accomplished with poly I-poly C and DEAE-Dextran, cycloheximide and actinomycin D. RNA was isolated with phenolchloroform and recrystallized from alcohol. Donor and recipient cells were trypsinized chicken or human embryonic cells or cultured mouse or monkey cells. The test virus was Venezualan Equine Encephalitis. Addition of the m-RNA led to a marked decrease in virus infectious titer, by one to five lg PFU, in both homologous and heterologous cells, indicating a nonspecific action. Pancreatic RNAase destroyed antiviral activity. Noninduced mRNA destroyed titer only 0.1 to 0.4 lg PFU. This phenomenon opens up new possibilities for studying discrimination between viral and cell matrix translation. Figures 1; references 10: 5 Russian, 5 Western.

USSR

UDC 577.153

STUDY OF EPHEDRINE DERIVATIVES AS SUBSTRATES AND INHIBITORS OF CHOLINESTERASES

Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 241 No 1 1978 pp 227-230  
manuscript received 18 Mar 78

ABDUVAKHA OV, A. A., KHAKIMOV, YU. R., MAYZEL', YE. B., ROZENGART, YE. V., SADYKOV, A. A., ASLANOV, KH. A. and SADYKOV, A. S., academician, Institute of Bioorganic Chemistry, Academy of Sciences UzbekSSR, Tashkent; Institute of Evolutionary Physiology and Biochemistry imeni I. M. Sechenov, Academy of Sciences USSR, Leningrad

[Abstract] The structural features of the active surface of cholinesterases were investigated by use of their reaction with 40 ephedrine (Eph) and pseudoephedrine (PsEph) compounds, used as substrates and reversible inhibitors of the enzymes. The latter were purified acetylcholinesterase (ACE), viz., KF 3.1.1.7 from human erythrocytes, activity 1.2 U/mg, and butylcholinesterase (BCE), viz., KF 3.1.1.7, from equine blood serum--prepared by the Perm Sci-Res Institute of Vaccines and Sera. Kinetic parameters of the reactions of ACE and BCE with Eph and PsEph derivatives were determined. Rate of enzymatic hydrolysis was assayed potentiometrically within a range of substrate concentration. Derivatives tested were monoesters of Eph and PsEph; their iodomethylates; diesters of Eph and PsEph; and their iodomethylates. A wide range of properties--tabulated--were found, from a specific substrate to a highly-specific reversible inhibitor. The properties were seen to involve differences in the structures of the diastereomeric analogs of Eph and PsEph. References 10, Russian.

USSR

UDC 616-076.4:616.16:616.831:576.8.097.29

CHANGES IN THE HEMATO-ENCEPHALIC BARRIER AND IN THE CYTOARCHITECTONICS OF THE CELLS OF THE CEREBRAL CORTEX DURING ENDOTOXIN SHOCK

Kiev TSITOLOGIYA I GENETIKA in Russian Vol 12 No 3 May/Jun 78 pp 225-227  
manuscript received 28 Feb 77

BARDAKHCH'YAN, E. A. and GORDEYEV-GAVRIKOVA, T. V., Rostov Medical Institute

[Abstract] In the absence of literature on the effect of endotoxin shock on ultrastructural shifts in the cerebral cortex in the early stages, the authors felt it would be of interest to identify initial alterations in the capillaries and cells of the sensomatory zone of the cortex (in dogs)

in endotoxin shock. The shock was induced in dogs by intravenous administration of typhoid endotoxin (5 mg/kg). Specimens for electron microscopy (instrument UEMB-100K) examination were mounted in epon. Administration of the endotoxin evoked damage of the endothelial cells and increased permeability, with extravazation of plasma and of formed elements of the blood. Destruction of the intracapillary circulation permitted development of dystrophic and degenerative changes in the neurons and glial cells. Demyelinization and destruction of axoplasm appeared in the myelin fibers, most often in the thickest (in diameter) axons. Electron microscopic pictures show the ultrastructure of the capillaries of the cerebral cortex and ultrastructure of the cerebral cortex during the shock. Figures 2; references 18: 7 Russian, 1 Czech, 10 Western.

USSR

UDC 615.212.7:547.943

#### PHARMACOLOGY OF AZIDOMORPHINE

Moscow BYULLETEN' EKSPERIMENTAL'NOY BIOLOGII I MEDITSINY in Russian  
Vol 85 No 6, Jun 78 pp 685-688 manuscript received 9 Jan 78

BULAYEV, V. M., ZAKUSOV, V. V., KNOLL, J. and CHICHENKOV, O. N., Institute of Pharmacology, Medical Faculty, Budapest Zemmelveiss University and Institute of Pharmacology, Academy of Medical Sciences USSR, Moscow

[Abstract] Comparison of effects of azidomorphine and morphine on synaptic transmission in various parts of the central nervous system was conducted in rabbits, cats and rats using impulse summation or extracellular registration of spontaneous and induced biopotentials. Impulse summation was studied in normal rabbits on nociceptive stimulation of the rear extremities, while somatosensory synapse sensitivity was determined in cats and rats immobilized with anatruxon and under artificial respiration, using a glass microelectrode and intraarterial bradykinin. Azidomorphine was found to weaken impulse summation at doses of 0.005-0.01 mg/kg, while morphine required 0.5-1 mg/kg, reflecting azidomorphine's increased analgetic activity. Neuronal activity was usually but not always depressed by 0.02-0.3 mg/kg azidomorphine and restored by nalorphine. Spinal intercalary neuron stimulation by bradykinin was inhibited by azidomorphine at doses 10-20 times more than morphine. Azidomorphine is thus demonstrated to act in the same manner as morphine and to be 20-100 times more potent. Figures 2; references 14: 4 Russian, 10 Western.

USSR

UDC 616-006-08:615.277.3 (Lyukanton)

MOLECULAR MECHANISM OF ANTITUMOR EFFECT OF LUCANTHONE

Leningrad VOPROSY ONKOLOGII in Russian Vol 24, No 1, 1978 pp 91-94

REZTSOVA, V. V., GORYUKHINA, T. A. and SEYTS, I. F., Laboratory of Biochemistry of the Order of Labor's Red Banner Scientific Research Institute of Oncology imeni Prof N. N. Petrov, Ministry of Health USSR

[Abstract] Lucanthone, an antiparasitic drug, has an inhibiting effect on the synthesis of bacterial RNA and intensifies radiation damage to cell. Its use in radiation therapy has had good results (Turner, et al, 1975) the molecular mechanisms of lucanthone upon the biosynthesis of cytoplasmic RNA are examined and the results presented in a table. Lucanthone slows down the assimilation of H-uridine into the ribosomes of rat liver, retards Erlichs carcinoma, and hinders the biosynthesis of ribosomal RNA in cases of Seidels hepatoma. It has no effects upon the quantitative content of the main fractions of RNA (4S, 18S, 28S), nor has it any effect on NK/ly lymphoma in rat liver. References 7; 2 Russian, 5 Western.

USSR

UDC 612.827

ELECTROPHYSIOLOGICAL ANALYSIS OF CORTICO-CEREBELLAR CONNECTIONS IN MONKEYS

Yerevan BIOLOGICHESKIY ZHURNAL ARMENII in Russian Vol 31 No 4 Apr 78  
pp 365-369 manuscript received 20 Feb 78

SOFIADIS, N. F., Institute of Experimental Pathology and Therapy, Academy of Medical Sciences USSR, Sukhumi

[Abstract] The connection of the cerebral cortex with the cerebellum has already been studied in detail; the present article reports study of cortex-cerebellum connections in awake monkeys (*M. mulatta*) by the method of evoked potentials. Electrodes were imbedded into the brain, under nembutal, at 16 different points of the cerebellar cortex (lobes III, IV, V, Simplex and Crus-1). Electrodes were inserted into the cerebral cortex in the frontal, motoric, somatensory, parietal and occipital regions of both hemispheres. When various points of the cerebral cortex (fields 9,6,4,2,7 and 17) were electrically stimulated, evoked potentials appeared in the rostral sections of the cerebellar cortex, most pronounced in stimulation of the motoric (field 4) and occipital (field 17) zones. Responses could be recorded bilaterally and sometimes had short, latent periods on the order of 1-2 mcs. This supported the suggestion of direct, monosynaptic connections between the cerebral and cerebellar cortex. Figures 2; references 21: 7 Russian, 14 Western.

EFFECT OF ELECTRICAL STIMULATION OF THE HYPOTHALAMIC SUPRAOPTIC ZONE  
ON LIPID METABOLISM AND DEVELOPMENT OF ATHEROSCLEROSIS

Moscow BYULLETEN' EKSPERIMENTAL'NOY BIOLOGII I MEDITSINY in Russian  
Vol 85 No 6, Jun 78 pp 661-664 manuscript received 20 Jul 77

ZAVODSKAYA, I. S., MOREVA, YE. V., SINITSYNA, T. A., RYZHENKOV, V. YE.,  
NIKUL'CHEVA, N. G. and MOSINA, I. V., Departments of Pharmacology and  
Atherosclerosis, Institute of Experimental Medicine, Academy of Medical  
Sciences USSR, Leningrad

[Abstract] In order to study the influence of negative psychogenic factors on the development of atherosclerosis, 30 male rabbits were administered 0.5 g/kg cholesterol for 3-8 weeks and were then subjected to electrical stimulation of the supraoptic hypothalamal zone daily for one hour over 7-25 days. The stimulation was found to increase the level of cholesterol in the plasma accompanied by a tendency to increase in levels of free fatty acids, glucose and triglycerides. Cholesterol content in the liver, and 11-oxycorticosteroids, in the plasma, were unchanged. Noradrenalin content in the cardiac muscle was decreased, as was creatine phosphate, while inorganic phosphate and lactic acid levels were increased. The changes in myocardial metabolism appeared more rapidly than in nonstimulated animals. Venous plethora, more capillary hyperemia, stasis and hemorrhage were noted after stimulation, as was wall hypertrophy in the coronary artery. Pathomorphological changes in the heart muscle were more pronounced. The data indicate that electrical stimulation accelerated the development of atherosclerosis. Figures 3; references 14: 6 Russian, 8 Western.

USSR

UDC 613.6:681.31.007.51:612.80

FUNCTIONAL STATE OF THE NEUROMUSCULAR SYSTEM IN WORKERS AT ELECTRONIC  
COMPUTER CENTERS

Moscow GIGIYENA I SANITARIYA in Russian No 4, Apr 78, pp 26-29 manuscript  
received 3 Mar 77

KONONENKO, A. A. and DERKACH, V. V., candidates of medical sciences,  
Kharkov Scientific Research Institute of Labor Hygiene and Occupational  
Diseases

[Abstract] The observations covered 38 mathematician-programmers, and 34 operators, aged 20-35, who had worked from 2 to 10 years. The observations ranged from 8 to 30 hours. Changes in muscular endurance for the right and left hands and changes in tremor frequency are presented, in three tables. The subjects were all healthy. All showed reductions in muscular endurance to static loads. These reductions were greater at the end of the workday. This indicates gradually developing fatigue during mental labor, due to irrational work conditions and hypokinesia. Tremors were more notable among individuals with jobs having significant emotional and nervous stress. The increase in tremors during the workday had no statistical significance. References 7, Russian.

USSR

UDC 575.24:633.11

STUDY OF THE MUTAGENIC ACTION OF SOME PESTICIDES ON SPRING DURUM WHEAT

Kiev TSITOLOGIYA I GENETIKA in Russian Vol 12 No 3 May/Jun 78 pp 207-212  
manuscript received 27 Jun 77

LOGVINENKO, V. F. and MORGUN, V. V., Institute of Molecular Biology and Genetics, Academy of Sciences UkrSSR, Kiev

[Abstract] This article is a study of the cytogenetic and genetic effect of the herbicides 2,4-D, the sodium salt of 2,4-D, the amine salt of 2,4-D, the effects of the organophosphorus insecticides chlorofos and phthalofos, and, also, the effect of the gametocide etrel when these agents are used on spring durum. The wheat sort studied was Khar'kovskaya-46; the agent was sprayed on seeds or on a stage of  $M_1$  growth. Mutagenic action was measured by chromosome aberration and chlorophyll mutations. Spraying of vegetating durum with 2,4-D derivatives and etrel increased the frequency of chromosome damage in myosis by factors, respectively, of 2.8-5 and 3.6-4.1. Chlorofos and phthalofos, used at levels higher than those recommended in agricultural processes, increased the spontaneous level of chromosome aberrations by a factor of 3.1-5.5. Phthalofos induced visible chlorophyll mutations. Tabulation is presented of the myotic action of all of the agents cited and of the activity of the agents in induction of chlorophyll mutations in  $M_2$  plants. The danger is stressed of use of doses higher than the recommended, established levels of the agents in agriculture.

USSR

GENETIC POSSIBILITIES FOR MAIZE IMPROVEMENT

Kishinev SEL'SKOYE KHOZYAYSTVO MOLDAVII in Russian No 4, Apr 78 pp 41-42

MIKU, V., chief of the laboratory of genetics, Moldavian Scientific Research Institute of Maize and Sorghum, "Gibrid" Scientific Production Association, candidate of agricultural sciences

[Abstract] A report on genetic studies for increasing the yield of maize by breeding plants with vertical leaves, enabling the crop to grow more thickly without shading lower leaves. Under favorable conditions, the yield of such hybrids is 15-20% higher than ordinary hybrids. Investigations have also been made of genetic factors that influence the quality

of silage and grain, and it has been found that high yield can be combined with improved nutritional value. The yield of hybrid seeds is increased by using the genes tassel-seed-1 and tassel-seed-2. Studies are also being done on the genetic factors that influence the parental forms. This research should result in improved effectiveness of hybrid vigor in maize production.

USSR

#### OUTLOOK FOR IMPROVEMENT OF GRAIN QUALITY

Kishinev SEL'SKOYE KHOZYAYSTVO MOLDAVII in Russian No 4, Apr 78 pp 39-40

ROTAR', A., chief of the laboratory of biochemistry and physiology of the Moldavian Scientific Research Institute of Maize and Sorghum, "Gibrid" Scientific Production Association, candidate of biological sciences, and REVIN, YE., science worker of the Institute of Maize and Sorghum

[Abstract] A report on determining the grain quality of different types of hybrid maize during the selection process. The grain improvement program is based on the Metz-Nelson discovery of the biochemical action of the recessive genes "opaque-2" and "floury-2." Data are given on the biochemical processes of formation of the grain harvest of ordinary (+/+) and opaque (o2/o2) hybrids. The results of the studies show that protein and lysine accumulation takes place almost identically in the o2-hybrids. However, quantitative data on these indices vary depending on the genotype. The best with respect to lysine content in protein are the simple hybrids W153P x A632 and C5 x A619. The investigated high-lysine hybrids also differ from the ordinary hybrids in the content of other amino acids. The grain of the o2-hybrids shows elevated contents of arginine, aspartic acid, glycine, alanine, methionine, and less proline, leucine and phenylalanine. These shifts are conducive to an improvement of nutritional value and also amount of assimilated protein. Calculations show that this maize can yield an additional 9.3 kg of lysine per hectare, which is 40% more than ordinary maize.

USSR

UDC 581.2

EFFECTS OF SNOWY MOLD ON OXIDASE ACTIVITY IN RYE SPROUTS

Minsk VESTSI AKADEMII NAVUK BSSR in Belorussian No 3, 1978 pp 58-61

SEROVA, Z. YA., UTYRO, L. B., NEAFITOVA, V. K. and NOVIK, N. A., Institute of Experimental Botany imeni V. F. Kuprevich, Academy of Sciences Belorussian SSR

[Abstract] Oxidases have been discerned to participate in the mechanism of resistance of certain plants to pathogenic fungi; this led to the present investigation of the various oxidases in the sprouts of resistant (Vyatka) and susceptible (Danaye) rye varieties infected with the snowy mold agent (*Fusarium nivale*). Enzyme determinations on the 8th and 10th post-infection days demonstrated that the polyphenoloxidase system was activated earlier in the Vyatka variety than in Danaye vis-a-vis control activities in uninfected sprouts. On the 10th day ascorbic acid oxidase was the most active oxidase in the Danaye variety, whereas cytochrome oxidase was the most active enzyme in Vyatka sprouts. The data appear to support the hypothesis that the earlier appearance of fungi toxic products resulting from phenol oxidation may be a factor in the resistance of Vyatka rye to the snowy mold. Furthermore, the greater cytochrome oxidase activity in the resistant variety assures adequate energy supplies for maintaining essential metabolic pathways during infection. References 10: 1 Czech, 2 Western, 7 Russian.

USSR

UDC 633.15:581.116:581.032

WATER DEFICIT AND THE WATER CONTENT AND RESPIRATION OF DROUGHT-RESISTANT CORN HYBRIDS

Kiev FIZIOLOGIYA I BIOKHIMIYA KUL'TURNYKH RASTENIY in Russian No 3, 1978 pp 257-263

TREGUBENKO, M. YA., FILIPPOV, G. L., and VISHNEVSKIY, N. V., All-Union Scientific Research Corn Institute, Dnepropetrovsk

[Abstract] Experimental analyses have demonstrated that drought-resistant hybrid corn varieties differ greatly in their response to drought. Basically, their drought-resistance, i.e., tolerance of heat and of loss of water, rests on an increase in the water-storing capacity of leaves, a reduction in the rate of transpiration, and an increase in respiratory activity.

Such factors as the innate physiologic characteristics of the drought-resistance varieties of corn should be evaluated in combination with meteorologic factors to determine the best varieties suitable for a given geographic zone. Figures 1; references 19: 1 Ukrainian, 18 Russian.

USSR

UDC 631.423.2.811

EFFECTS OF SOIL MOISTURE AND OTHER SPROUTING FACTORS ON WATER UPTAKE  
BY WINTER WHEAT

Kiev FIZIOLOGIYA I BIOKHIMIYA KUL'TURNYKH RASTENIY in Russian No 3, 1978  
pp 250-256 manuscript received 27 Jun 77

SLUKHAY, S. I., KIRICHENKO, V. P. and LATASHENKO, O. P., Institute of Plant Physiology, Academy of Sciences Ukrainian SSR, Kiev, and the Nikolayevskaya Oblast Experimental Agricultural Station

[Abstract] Studies conducted with the Kavkaz variety of winter wheat demonstrated that under laboratory and field conditions lack of soil moisture leads to adaptive changes in the plants resulting in more economic utilization of available water. However, temporary lack of water leads primarily to changes which reflect disruption of anabolic processes resulting in lower quality grain and lower yields. High productivity under conditions of irrigation and appropriate mineral fertilization lowers the water utilization coefficient. Although under such conditions the kernel protein content is generally decreased, the greater yields more than make up for this change. Diminution of the water utilization coefficient is favored by, in addition, appropriate predecessor crops (corn for silos, alfalfa), and deeper plough furrows (down to 33-35 cm) in the heavy loamy soils. References 11: 1 Ukrainian, 10 Russian.

USSR

UDC 581.133.1:581.192.7

EFFECTS OF DIMETHOATE (ROGOR) ON RESPIRATORY METABOLISM OF WHEAT ROOTS

Kiev FIZIOLOGIYA I BIOKHIMIYA KUL'TURNYKH RASTENIY in Russian No 3,  
1978 pp 240-244 manuscript received 24 Apr 77

MURAV'YEVA, A. S., CHIKOV, V. I. and KOVAKINA, YE. A., Institute of  
Biology, Kazan Branch, Academy of Sciences USSR, Kazan

[Abstract] Succinic dehydrogenase (SDH) activity has been shown to be elevated in various forms of cellular pathology and is presumed to serve a key role in supplying the energy needs of a cell under adverse conditions. Consequently, an investigation was made of the effects of treating 6-7 day old roots of Saratovskaya-29 wheat with  $10^{-4}$  -  $3 \times 10^{-3}$  M dimethoate (Rogor) on oxygen uptake and SDH activity. The resultant data showed that, under the experimental conditions employed, exposure of the root to dimethoate for 1-2 h resulted in a 30-50% increase in the activity of SDH and a concomitant decrease of 18-35% in oxygen consumption. Addition of exogenous succinate reversed dimethoate-induced inhibition of oxygen uptake and, in some cases, actually promoted a greater uptake above control levels. The data were interpreted to indicate that SDH possesses a regulatory significance in cellular adaptation to stress, such as dimethoate poisoning, since succinate oxidation bypasses NAD-dependent dehydrogenases and assures a more efficient supply of energy for the cell. Figures 3; references 18: 4 Western, 14 Russian.

USSR

UDC 633.11:581.4+577.1

EFFECTS OF PRE-SOWING CHLOROCHOLINE CHLORIDE TREATMENT OF WINTER WHEAT SEEDS ON SUGAR LEVELS IN FALL VEGETATION

Kiev FIZIOLOGIYA I BIOKHIMIYA KUL'TURNYKH RASTENIY in Russian No 3,  
1978 pp 232-239 manuscript received 20 Jul 77

PIKUSH, G. R., OMEL'YANETS, V. F. GRINCHENKO, A. L. and PYKHTIN, N. I.,  
All-Union Scientific Research Corn Institute, Dnepropetrovsk

[Abstract] Prior to planting, seeds of Bezostaya-1 (B-1) and Odessa-51 (O-51) winter wheats were treated with 10% chlorocholine chloride (CCC) in order to evaluate the effects of such pretreatment on fall vegetation. Analysis of the resultant data revealed that from early to late fall there was a gradual fall in the concentrations of reducing sugars in the tillering nodes and leaves, with a concomitant increase in the levels of disaccharides.

CCC pretreatment potentiated the phasic changes in the levels of the monosaccharides and disaccharides; under both experimental conditions-- control and CCC treatment--the sugar levels were higher in O-51 than in B-1. The data were interpreted to indicate that the formation and accumulation of disaccharides reflected a gradual metabolic shift to the storage of sugars having a protective value during the winter months and that CCC served to further winter hardiness. Figures 1; references 15: 1 Western, 14 Russian.

USSR

UDC 581.1:541.144

#### EFFECTS OF HEAT AND LIGHT ON THE VIABILITY OF WHEAT SEEDS

Kiev FIZIOLOGIYA I BIOKHIMIYA KUL'TURNYKH RASTENIY in Russian No 3, 1978 pp 227-231 manuscript received 16 Jun 77

TIMOSHENKO, V. M., DVERNYAKOV, V. S., SHALIN, YU. P., SHCHERBATENKO, A. S. and MAZGAN, B. S., Institute of Materials Science, Academy of Sciences Ukrainian SSR, Kiev, and the Mironovka Research Institute of Wheat Breeding and Grain Production

[Abstract] In order to determine factors which influence sprouting and germination of wheat seeds, studies were conducted with Saratovskaya-29 spring wheat and Il'ichevka winter wheat exposed to sunlight and thermostat heat. Exposure of Saratovskaya-29 seeds (8% moisture content) to 100 RE (5 min) or 200 RE (15 min) [Re=relative units=(energy density at plane of irradiation in cal/cm<sup>2</sup>·min)/(normal energy density of solar radiation in cal/cm<sup>2</sup>·min)] had a stimulatory effect on germination and sprouting vis-a-vis control findings. However, exposures of 500 or 600 RE (30 min) were inhibitory. At 100 and 200 RE internal seed temperatures reached 32-68°C. Thermostat heating showed that an internal temperature of 48-67°C was required for positive effects, while a temperature of 106°C was markedly inhibitory and 117°C was lethal. In the case of Il'-ichevka seeds thermostat heating leading to an internal temperature of 94°C was inhibitory in terms of germination and sprouting. These findings point to the importance of biovariability in determining the effects of sunlight and pure heat on wheat seeds. Figures 3; references 12: 4 Western, 8 Russian.

USSR

UDC 582.281.14:577.156.7

VARIATION OF PHYTOALEXIN-INDUCTION ACTIVITY IN THE MYCELIUM OF THE PATHOGEN OF POTATO LATE BLIGHT WITH THE AGE OF THE FUNGUS

Leningrad MIKOLOGIYA I FITOPATOLOGIYA in Russian Vol 12, No 3, 1978  
pp 211-215 manuscript received 11 Apr 77

LYUBIMOVA, N. V. and OZERETSKOVSKAYA, O. L., Institute of Biochemistry  
imeni A. N. Bakh, Academy of Sciences USSR, Moscow

[Abstract] A study is presented of the phytoalexin-inducing activity of the cytoplasmic contents of *Phytophthora infestans* (Mont.) and its variation with age of the fungus. Attention is also given to the study of the possibility of a relationship between the phytoalexin-inducing activity and proteolytic activity of the pathogen of potato late blight. The data obtained in the experiment show that the quantity of protein extracted by water from mycelia changes little with age of the fungus. However, the quantity of carbohydrates decreases greatly as time passes and the induced activity of the extracts increases. Apparently, as the fungus grows, the water-soluble proteins and carbohydrates of the mycelium undergo certain changes. The results of fractionation indicate that the mycelia of *Ph. infestans* contain phytoalexin inducers which differ in their molecular size. It is possible that the various fractions contain inducers with the same active center, to which various fragments may be added. The increase in the content of low-molecular inducing compounds with growth of the fungus may result from hydrolytic splitting of the more active high-molecular inducers. Also, as the phase of active growth of the fungus ends, the formation of high-molecular products may slow down, resulting in accumulation of the low-molecular precursors. References 11: 4 Russian, 7 Western.

USSR

UDC 582.285.22:577.17

PRESENCE OF INDOLYL-3-ACETIC ACID IN UREDOSPORES OF WHEAT STEM RUST

Leningrad MIKOLOGIYA I FITOPATOLOGIYA in Russian Vol 12, No 3, pp 222-226  
manuscript received 3 Jul 76

UMNOV, A. M., ARTEMENKO, YE. N. and CHKANIKOV, D. I.

[Abstract] An attempt was made to determine the content of derivatives of IAA in the uredospores of wheat stem rust. Free IAA was extracted from cell-free extract of the uredospores of *Puccinia graminis* f. sp.

tritici of the Moscow population. The preparation produced was chromatographed on cellulose in an anhydrous medium, subjected to gel filtration and thin-layer chromatography. None of the methods produced free IAA. The experiments demonstrated that the uredospores did contain significant quantities of IAA derivatives, up to 650  $\mu$ G of IAA in the esterified form per kg, plus amino acid conjugates of IAA and indolyl-3-butyric acid. Figures 4; references 11: 1 Russian, 10 Western.

USSR

UDC 632.95024.13:582.28843:633.11

EFFECTS OF THE RETARDANTS TUR AND ETREL ON THE SPRING WHEAT ROOT ROT PATHOGEN

Leningrad MIKOLOGIYA I FITOPATOLOGIYA in Russian Vol 12, No 3 pp 227-229  
manuscript received 7 Jul 77

BENKEN, A. A., SIKORSKIY, I. A. and GALAKTIONOV, K. V., All-Union Institute for Plant Protection, Leningrad; Kurgan Scientific Research Institute for Grains

[Abstract] A study was made in 1975 of the influence of the retardants tur (trimethylammonium chloride) and etrel (2-chloroethyl phosphonic acid) on the dynamics of development of ordinary root rot. The experiments were conducted on Saratovskaya 39 spring wheat and Omsk 13 709 barley. These studies have now been followed by a series of laboratory experiments to determine the influence of the retardants on the root rot pathogen. It was found that although tur and etrel do not have fungicidal properties, they do depress the growth of *Helminthosporium sativum* Pamm., King et Bakke. Etrel greatly delays sprouting of the conidia of the pathogen, tur significantly inhibits growth of the mycelium. Both retardants suppress spore formation in the root rot pathogen. Figure 1; references 8, Russian.

USSR

UDC 632.934:582.281.25

EFFECT OF SOME CHEMICAL COMPOUNDS ON THE PATHOGEN OF POTATO CANCER,  
SYNCHYTRIUM ENDOBIOTICUM (SCHILB.) PERC.

Leningrad MIKOLOGIYA I FITOPATOLOGIYA in Russian Vol 12, No 3, pp 230-232  
manuscript received 26 Jan 76

DOLYAGIN, A. B., SIMONYAN, G. G., VOLOVIK, A. S., RESHETOVA, E. K.,  
MILOSLAVOVA, T. A., KRUGLYAKOVA, K. YE. and EMANUEL', N. M., Institute  
of Chemical Physics, Academy of Sciences USSR; Scientific Research  
Institute for Potato Growing, Kraskovo, Moscow Oblast

[Abstract] A study is made of the fungicidal properties of a number of chemical compounds. The effects on the potato-cancer pathogen of substances which have been shown to be effective in suppressing tumor formation was tested. The substances included 2,6-di-tert-butyl-4-methylphenol (ionol), polyoxyethylene sorbitan monostearate (twin-60), 2,4-dichlorophenyl-dichloroethane (DDD), N-nitroso-N-methylurea (NMN) and chromium trioxide, an active oxidizer of organic substances. The studies indicated that nitrosomethylurea was effective against the potato-cancer pathogen. Following treatment with this compound, the fungus loses its ability to damage the plants. The combined effect of chromium trioxide and low concentrations of nitrosomethylurea was also found to be effective. References 7, Russian.

USSR

UDC 632.4:633.511.582.288.42

A DONOR OF RESISTANCE TO PHYSIOLOGICAL RACE 2 OF THE PATHOGEN OF COTTON  
VERTICILLIUM WILT

Leningrad MIKOLOGIYA I FITOPATOLOGIYA in Russian Vol 12, No 3, pp 236-241,  
manuscript received 18 Jul 77

MATVEYEV, G. G., TRIBUNSKIY, A. N. and ZHURAYEV, K., Andizhan Affiliate of  
the All-Union Scientific Research Institute for Cotton Farming, Leninsk,  
Andizhanskaya Oblast

[Abstract] Combined studies of the Andizhan Affiliate of the Research  
Institute for Cotton and the All-Union Institute for Plant Protection have  
identified two physiological races (groups of biotypes) of the cotton wilt  
pathogen. It has been found that the diploid cotton *Gossypium davidsonii*  
from the U.S.A., while susceptible to physiological Race 1, is resistant

to Race 2 of the verticilliosis pathogen, which is virulent for the cotton currently in use in the USSR. *G. davidsonii* can thus be used as a donor to produce varieties of cotton with a new wilt-stable genotype. References 20, Russian.

USSR

UDC 632.4:633.11

#### PATHOGENICITY OF THE PATHOGENS OF SPRING WHEAT ROOT ROT

Leningrad MIKOLOGIYA I FITOPATOLOGIYA in Russian Vol 12, No 3, pp 248-251, manuscript received 4 Aug 77

POPOV, V. I., KUMACHEVA, YE. M. and KOZLOVSKAYA, P. I., Leningrad Agricultural Institute; All-Union Institute for Plant Protection, Leningrad

[Abstract] An attempt was made to evaluate the pathogenicity of certain strains and biopreparations of helminthosporious and fusarious root rot pathogens. The data produced showed that the pathogens of the root rot of spring wheat are facultative parasites and only under certain ecological conditions (for example, a shortage of moisture in the soil) can they cause the pathologic process leading to a decrease in yield. It is noted that root rot also appeared in the non-infested control plants if non-sterile field soil was used. Further studies of the pathogenicity of the pathogens, peculiarities of pathogenesis and harmfulness of the disease known as root rot are needed, using the latest experimental methods. References 8, Russian.

USSR

UDC 632.4:633.11

#### PHYTOTOXICITY OF WINTER WHEAT ROOT ROT PATHOGENS

Leningrad MIKOLOGIYA I FITOPATOLOGIYA in Russian Vol 12, No 3, pp 256-258, manuscript received 3 Feb 76

IVASHCHENKO, V. G. and LAN, N. T., All-Union Institute for Plant Selection and Genetics, Odessa; Odessa State University imeni I. I. Mechnikov

[Abstract] Biological tests are used to determine phytotoxic substances formed by microorganisms. The information available on the chemical nature

of these toxins is insufficient, and the phytotoxic effect may be caused by a group of substances. The biotests used to estimate toxicity included human renal tissue culture, chick embryo fibroblasts, lupine culture, wheat seeds and corn sprouts. It was found that the lupine tissue and chick embryo fibroblast cultures were most sensitive, determining doses of toxins which could not be determined from the growth effects on the sprouts. The data of the investigations indicated that the fungi of the group *Mycelia sterilia*, *Rhizoglyphus nigrosporoides* and *Gloeosporium bolleyi*, infesting winter wheat, should be of interest for further study, although they have practically never been studied. References 6: 5 Russian, 1 Western.

USSR

UDC 632.4:582:281.21:633.854.78

DEVELOPMENT AND HARMFULNESS OF RHIZOPUS NODOSUS NAMYSL. ON SUNFLOWERS

Leningrad MIKOLOGIYA I FITOPATOLOGIYA in Russian Vol 12, No 3, pp 260-263, manuscript received 4 May 76

SVETOV, V. G., All-Union Scientific Research Institute for Oil Crops imeni V. S. Postovoit, Krasnodar

[Abstract] A study is made of the development of *rhizopus nodosus namysl.* under field conditions. It is found that the disease caused by this pathogen initially develops in a manner similar to wet rot. The initial rot process then rapidly propagates over the entire head. Laboratory studies show that the most favorable temperature for growth of the mycelium is 25-34C. Fungus colonies reached 90 mm. in diameter in 48 hours at this temperature. The disease at present affects only 0.3-1.5% of plants, and removal of infested heads before harvesting of the seeds is an effective means of control. References 4, Russian.

USSR

UDC 572.51.087.2

## ALGORITHM FOR DRAWING UP STANDARD TABLES FOR INDIVIDUAL ASSESSMENT OF THE PHYSICAL DEVELOPMENT OF THE POPULATION

Moscow GIGIYENA I SANITARIYA in Russian No 4, Apr 78, pp 70-75 manuscript received 18 May 77

Prof POLYAKOV, L. YE, professor, MALINSKIY, D. M., candidate of medical sciences, TARANDA, N. N. and GUREVICH, V. YU., Military Medical Academy imeni S. M. Kirov, Leningrad

[Abstract] P. N. Bashkirov's method examines the relationship between three basic characteristics: age, circumference of the chest, and body weight. An algorithm has been worked out for a previously-described method (L. YE. Polyakov and others 1969, 1972). The eighteen step algorithm can be computed on computers or desk calculators. The equations are based upon the previous factors. The modification of Bashkirov's method makes it possible to evaluate these indicators for a wide range of combinations. It is possible to reduce the ranges in the 95.5% ellipsoid. Using a Minsk 22 computer one can obtain a standard table in 1 minute, 15 seconds. A flow chart for the 18 step algorithm and a standard table are presented. Figures 1; references 6, Russian.

USSR

UDC 613.5 725.51(-21)

## HYGIENIC ASSESSMENT OF TYPICAL DESIGNS OF CITY GENERAL HOSPITALS

Moscow GIGIYENA I SANITARIYA in Russian No 4, Apr 78, pp 18-22, manuscript received 19 Sep 77

ZARIVAYSKAYA, KH. A., professor, and MATUSEVICH, V. G., candidate of medical sciences, Kiev Scientific Research Institute of General and Municipal Hygiene imeni A. N. Marzeyev

[Abstract] Four standard hospital designs are examined [254-1-55, (1969, 1,000 bed); 254-1-2 (1967, for 300 beds); 2S-05-34 (1964, for 600 beds), 252-1-33 (1973, for 600 beds)]. Special attention is given to the geographical orientation of the wards (with respect to southern exposures), their size and floor area. The optimal parameters of these features and the number of floors, amount of windows, climate control, have not been subjected to sufficient scientific feasibility studies. There are not sufficient sanitary barriers between the wards and the functional areas,

the amount of greenery has been reduced and there are not sufficient parking facilities. The new design (No 252-1-33) meets hygienic requirements. There have been improvements, such as the centralization of departments (No 254-1-15, 254-1-2). However, some designs (No 2S-05-34, 254-1-15, 254-1-2) have not changed, they are still two stories, with 80% of the wards on the East and 20% on the North. The increase in the number of specialties in hospitals (from 5 to 18) has required a differentiated approach to design. The ventilation norm of 40 cubic meters per hour is not sufficient, as studies have indicated that it should be at least 80-100 m<sup>3</sup>/h per patient in southern regions. The optimal microclimate conditions have not been determined for all types of patients. Design No 252-1-33 has centralized elevators and diagnostic departments, reducing staff and patient movement. References 8, Russian.

USSR

UDC 539.16.047

THERMAL STRESS AND RADIOSENSITIVITY OF SOME BODILY ENZYME SYSTEMS

Yerevan BIOLOGICHESKIY ZHURNAL ARMENII in Russian Vol 31 No 4 Apr 78  
pp 383-387 manuscript received 3 Oct 77

MATYUSHICHEV, V. B., TARATUKHIN, V. R. and SHAMRATOVA, V. G., Leningrad  
State University

[Abstract] Male rats, 160-180 g, were subjected to combined action of hyperthermia and radiation. Animals with an epilated section of the back were subjected to 4 hr in a sealed heat chamber at 36° and relative humidity of 80-90%; simultaneously, the rats were exposed to beta-radiation of 85 Kr in doses of 2.5, 3.05, 4.45 or 7.4 krad. After removal from the chamber they were exposed to doses of X-ray radiation (RUM-3 apparatus) of 25, 50, 100, 250 and 500 rad. Separate animal groups received respectively 2.5 krad + 25 r; 2.5 krad + 50 r; 3.05 krad + 100 r; 4.45 krad + 250 r; 7.4 krad + 400 r. Effect of the combined stresses on ATPase and creatinkinase activity of aqueous extracts from the epilated sections of the back was examined and compared to the controls which had not been subjected to thermal stress. Results are tabulated. The heat does stimulate increase in enzyme activity, but reduces the sequelae of radiation. References 5, Russian.

USSR

UDC 576.3.088

STUDY OF THE CYTOGENETIC ACTIVITY OF RADIOPROTECTORS IN A CULTURE OF HUMAN LYMPHOCYTES. REPORT V.

Kiev TSITOLOGIYA I GENETIKA in Russian Vol 12 No 3 May/Jun 78 pp 228-231  
manuscript received 5 Jul 77

AGUTYUNYAN, R. M., DANIELYAN, E. A., OGANYAN, V. K. and SARKISYAN, T. F.,  
Yerevan State University

[Abstract] Discovery of correspondence of empirical data on distribution of damaged chromosomes in cells to geometric distribution, the first instance of use of the theory of mass maintenance in cytogenetics, became the starting point for a study which further revealed that correspondence of empirical data to Pascal's distribution is seen with a number of mutagens. These studies stimulated new approaches to research on chemical mutagens and on select aspects of cytogenetics. In the present article,

a report is made of study of a possible differential effect of radioprotectors on various stages of the cell cycle. Reagents studied were the mutagen thiotef and the protectant APAETF-2,3. These were added to a culture of human lymphocytes at the 28th hour of cultivation and were not washed until fixation at the 58th hour of cultivation. A mathematical handling is suggested of the data from analysis of the effect, on cell components, by the radioprotector. The effect analyzed is injury to chromosomes. Distribution of the chromosome aberrations into their geometric components is shown to be possible. Tabulation is made of the geometric distribution with administration of thiotef and of the protectors (cystafos was also used). Frequency of distribution increased in presence of APAETF-2,3. References 5, Russian.

USSR

UDC 616-006.04-08[615.277.3:615.032-611.13

INTRAAARTERIAL REGIONAL INJECTION OF RADIOACTIVE DRUGS IN TREATMENT  
OF MALIGNANT TUMORS

Leningrad VOPROSY ONKOLOGII in Russian Vol 24, No 1, 1978 pp 99-109

BARDYCHEV, M. S., ANDROSOV, N. S. and NIKITINA, R. G., candidates of medical sciences, Scientific Research Institute of Medical Radiology, Academy of Medical Sciences USSR, Obninsk

[Abstract] A review of Soviet and foreign literature on the subject, with detailed coverage of Italian (Caldarola, Poli, Badellino, Dogliottia) and American studies. The optimal size of the radioactive particles in the colloid injected is 5-30 microns. The Italians use radioactive phosphorus having a half life of 14.3 days, while Americans use radioactive yttrium with a half life of 2.6 days. A formula for the calculation of dosages, developed by workers at the dosimetric lab at the Scientific Research Institute of Oncology and Medical Radiology, Belorussian SSR Ministry of Health, includes radioactivity, body weight, half life, and organ absorption as factors. The use of this method for tumors of the liver, lungs, and brain, is briefly discussed, especially with reference to Caldorola, Badellino and Simon. Although it has been deemed a suitable treatment, it is not widely used because it has not received sufficient experimental study and results are not uniform. References 123: 47 Russian, 76 Western.

USSR

UDC 616.71+616.73]-074:[543.2:541.28

NEW METHOD OF DISSOLVING SAMPLES OF MUSCLE AND BONE TISSUE FOR RADIO-CHEMICAL ANALYSIS OF CESIUM-137 AND STRONTIUM-90

Moscow GIGIYENA I SANITARIYA in Russian No 4 Apr 78, pp 69-70 manuscript received 22 Jun 77

TEPLYKH, L. A., candidate of medical sciences and DIKAYA, YE. YA., Leningrad Scientific Research Institute of Radiation Hygiene

[Abstract] The present method of drying test samples is not suitable for large samples, and there is a danger of overheating and losing Cs137 through evaporation. The direct dissolving of samples without mineralization avoids these difficulties. Samples were dissolved in distilled water and filtered. The extraction of Cs137 was complete (99.5%) and for Strontium-90 it was 99.6%. Sample sizes of 1.5-2 kg were used and 99.3% of the Cs137 was extracted. The process takes 20-25 minutes and can be used for samples with any degree of activity. References 1, Russian.

USSR

UDC 614.3:57.087.45]:658.387

ORGANIZATION OF LABOR AT A RADIOLOGICAL LABORATORY

Moscow GIGIYENA I SANITARIYA in Russian No 4 Apr 78, pp 97-98 manuscript received 19 Jul 77

SUKHOMLINA, A. N., candidate of medical sciences, BUYANOVER, M. I., Zaporozhskaya Oblast Sanepidstation

[Abstract] Work is geographically divided between three physicians in order to cover all areas. Punchcards are used to record surveys and a journal of radioactive substance movement in the oblast is compiled. One can thus obtain information on such substances in enterprises and other installations. A journal of individual doses of radiation is also kept and standardized forms of dosimetric control and inspections are maintained. Control cards help in seeing that the suggested measures are taken. Physicians at urban and rayon sanitation and epidemiological stations check the implementation of oblast station suggestions. The cumulative method of computing the results of radiochemical research is used, based on punch cards. The lab also keeps books on outside assignments, on the number of facilities checked, the fines levied and facilities closed. These are discussed each quarter and an electronic calculator is used to process the data. No references.

# EAST GERMANY

## NEW ULTRASONIC ATOMIZERS

Leipzig MEDIZINTECHNIK in German Vol 18 No 2 May 78 pp 40-43

TROSTMANN, R., graduate physicist, and GROSS, Chr., graduate engineer  
VEB, "Germann Matern" Transformer and X-Ray, Medical Electronics Plant,  
Hohen Neuendorf

[Abstract] Three ultrasonic atomizers (two models, one in two versions) developed at Hermann Matern Transformer and X-Ray Factory State Enterprise are described and illustrated with photographs, block diagrams, and specification charts. The "TuR" USI 50 is an inhalator for one individual at a time with electronic atomization control, meterable therapeutic-agent injection system, piezo-electric lead zirconate oscillator, and ability to use heated supply solution. It uses an ultrasonic frequency of 2.64 MHz and can dispense 4-20 ml/min of solution at up to 33°C temperature, and is portable. The "TuR" USI 60 is a stationary inhalator, available in a room-atomizer version for group inhalation and in a single-individual inhalator version. It can provide the inhalation air in a 60 cubic meter room within 30 minutes, and operates without depositing particles. Generally designed and constructed as the "TuR" USI 50, it uses a mist-distribution network of pipes up to 5 m in length. The article describes the various uses for which the devices are recommended. The devices were designed in consultation with physicians so that they can be used in a versatile manner where inhalation therapy is required. Figures 6; references 5: 2 Russian, 3 German.

# CZECHOSLOVAKIA

## INCIDENCE OF HOSPITALIZATION FOR THE DEPRESSIVE PHASE OF AFFECTIVE PSYCHOSIS IN PRAGUE DURING 1963-1972

Prague CESKOSLOVENSKA PSYCHIATRIE in Czech Vol 73 No 5, Oct 77 pp 321-328

SKODA, C., BAUDIS, P., MATESOVA, A., KABESOVA, L. and SKODOVA, M.;  
Research Institute for Psychiatry, Prague; Clinic of Psychiatry, Medical  
Faculty of Hygiene, Charles University, Prague

[Abstract] A survey was made of the patients who were hospitalized for the first time during the period 1962 to 1972 in the City of Prague; 1487 among those suffered from endogenous depression. There were 163 persons hospitalized per 100,000 population. Among the 1487 patients there were

495 men and 992 women. The rate of incidence increased with increasing age and reached the highest value in the age group 50 to 59. Frequency of manic depression was 8.9 per 100,000 population, about equal for men and women; incidence decreased after the age of 25. Sixty-nine percent of the people who were hospitalized for the first time did not need a second hospitalization; the values were same for men and women. Comparison with the data of Great Britain, New Zealand, Poland and the USSR shows that Poland had the lowest and New Zealand the highest rates of hospitalization. Czechoslovakia, Great Britain and the USSR had similar incidence rates. It is not quite certain how identical were the criteria used in the individual countries for the evaluation of the disease. Figures 3, references 9: 3 Czech, 6 Western.

#### CZECHOSLOVAKIA

##### TRANSCUTANEOUS NEUROSTIMULATORS OF CZECHOSLOVAK MANUFACTURE

Prague CESKOSLOVENSKA NEUROLOGIE A NEUROCHIRURGIE in Czech Vol 41 No 2, Mar 78 pp 134-139 manuscript received 13 Oct 77

LEBL, M., SKRUZNY, J. and NEDVED, V., Neurosurgical Clinic, Faculty of General Medicine, Charles University, Prague; Central Military Hospital, Prague

[Abstract] The technical and physical conditions of transcutaneous neurostimulating electroanalgesia are discussed. The period of impulses should be 5 to 1000 ms (frequency 200 Hz); width of impulses 0.05 to 4 ms; amplitude of impulses 0 to 30 mA; the control limits of the constant current should correspond to changes in loading impedances within 0 to 1800 Ohms. There are two types of instruments; one for administration of the treatment by a physician, and a simplified version suitable for patient's self administration of the treatment. The instruments were designed at the Neurosurgical Clinic of the Charles University at Prague. Several of the instruments are shown in photographs. Figures 7; references 5: 2 Czech, 3 Western.

HUNGARY

EFFECT OF SCIENCE-POLICY GUIDELINES ON THE DEVELOPMENT OF RESEARCH IN  
THE FIELD OF ANIMAL BREEDING

Budapest ALLATTENYESZTES in Hungarian Vol 27 No 2, 1978 pp 97-104

SZABO, Jozsef, and SZENDRO, Peter, Ministry of Agriculture and Food,  
Budapest, and University of Agricultural Sciences, Godollo

[Abstract] The primary goal of the Science-Policy Guidelines, promulgated by the Policy Committee of the MSZMP [Hungarian Socialist Workers Party] is to strengthen the relationship between science and practical applications. Implementation of this goal in the field of animal breeding activities is in progress. The following are among the major steps undertaken or planned in this connection: the introduction of industrial-type animal breeding operations; the introduction of new and complex technologies in dairy and meat-producing vertical establishments; increased research activity; better cooperation among animal-breeding establishments, and between such establishments and research institutions; initiation of new cooperative projects with the relevant institutions of higher education; and monitoring and implementation of foreign achievements. Yet, much remains to be done, especially in the fields involving cooperation and balance between the various research, development, and implementation activities. Tasks still to be accomplished include increasing the percentage of contribution of animal-breeding activities to the total agricultural output (from the level of 45 percent in 1977), re-evaluation of the breeding stock with the aim of improving it, and scouting for new protein-feed sources. Twenty specific projects are listed as worthy of implementation. It was concluded that the science-policy guidelines have stood the test of time. No references.

## COMPUTERIZED IMMUNOGENETIC MONITORING OF CATTLE PARENTAGE

Moscow ZHIVOTNOVODSTVO in Russian No 3 Mar 78 pp 21-24

MASHUROV, A. M., candidate of biological sciences, Institute of General Genetics, Academy of Sciences USSR, UKHANOV, S. V., Chief of the Section of Computers, All-Union Scientific Research Institute of Breeding (VNIIPlem) and SOROKOVOY, candidate of veterinary sciences, All-Union Scientific Research Institute of Livestock Breeding (VIZh).

[Abstract] The need for good records in stock breeding, especially with increasing use of artificial insemination, is stressed. Note is made of the use, outside of the USSR, of the genetic method of monitoring cattle parentage; this method has also been successfully used in the Lithuanian SSR (1967, Z. I. Vagonis). Computer technology was adapted in 1974-1976 (in Mashurov's institute and at VIZh) by devising a system of algorithms and programs to automate genetic expertise on parentage based on blood groups; Minsk-22 and Minsk-23 computers were used. Data stored include blood and serology test results, animal name a/o number, date of birth, parentage, origin (farm), race, progeny, etc. The program processes the extensive immunogenetic data. The ideal system includes a selection center with access to a computer for processing of genetic data produced, in turn, by territorial zone laboratories on samples furnished by stock breeding installations or farms. Storage data retrieval, e. g., on 100 cattle, requires only 15 seconds. Apparently, the program is still in the developmental stages: the territorial zone laboratories are preparing the required blood-grouping reagents, a task to be taken over eventually by the Bioprom of the USSR Ministry of Agriculture. The selection centers and the territorial zonal labs still lack computers, hence it has been recommended that they be equipped with telegraph apparatus STA-2M (or Askota) for card-punch. Introduction of the program is expected to improve the culture (technological quality) and effectiveness of selection on breeding farms. Figures 2.

## CYCLE OF DEVELOPMENT OF BOVINE SARCOSPORIDIA

Leningrad PARAZITOLOGIYA in Russian Vol XII, Iss 2, Mar/Apr 78, pp 97-100

ZASUKHIN, D. N. and GADAYEV, A., Institute of Epidemiology and Microbiology imeni N. F. Gamaleya, Academy of Medical Sciences USSR, Moscow

[Abstract] Infections by Sarcocystis are widespread in Uzbekistan (100% of the sheep in Chimkentskaya Oblast, 99.3% in Alma-Atinskaya Oblast, for Uzbekistan as a whole 80% of the livestock, 70% of the camels and 40% of the pigs are infected). A review article published in Prague is cited. Foxes and wolves were fed cow hearts infested with *S. bovicanis* to determine its cycle in wild animals. After 7-8 days, cysts, averaging 14.5 x 11.2 microns, were found in the foxes, while in 7-9 days, 14.0 x 11.5 micron cysts were found in wolves. The *S. bovicanis* prepatent period was 7-8 days in foxes and 7-9 in wolves, while the patent period was 33 days for foxes and 28-34 in wolves. There were no substantial differences in sporocysts or oocysts. Wild animals are probably the final host. *S. bovicanis* has a dense membrane protecting it from the environment. References 17: 3 Russian, 1 Czech, 13 Western.